3/

REPORT RESUMES

ED 002 796 24

THE EFFECTS OF A PRESCHOOL PROGRAM UPON YOUNG EDUCABLE MENTALLY RETARDED CHILDREN--VOLUME 1, MEASURABLE GROWTH AND DEVELOPMENT.

BY- FOURACRE, MAURICE H. AND OTHERS
COLUMBIA UNIV., NEW YORK, TEACHERS COLLEGE
REPORT NUMBER CRP-167-1 PUB DATE 62
CONTRACT OEC-SAE-6444
EDRS PRICE MF-$0.27 HC-$5.60 140P.

DESCRIPTORS- *MENTAL RETARDATION, EDUCABLE MENTALLY HANDICAPPED, *CHILD DEVELOPMENT, *PRESCHOOL PROGRAMS, *GROUP EXPERIENCE, TEACHING METHODS, INSTRUCTIONAL MATERIALS, ACHIEVEMENT GAINS, MEDICAL EVALUATION, PSYCHOLOGICAL EVALUATION, *SOCIAL DEVELOPMENT, LANGUAGE ABILITY, *ACADEMIC ACHIEVEMENT, CURRICULUM DEVELOPMENT, IDENTIFICATION, EDUCATIONAL EXPERIMENTS, TEACHER EVALUATION, PARENT ATTITUDES, NEW YORK CITY, NEW YORK

AN EXPERIMENTAL PROGRAM FOR EDUCABLE RETARDATES, AGES 4 TO 6 YEARS, WAS CONDUCTED TO STUDY THE EFFECTS OF PLANNED GROUP PARTICIPATION UPON INDIVIDUAL ADJUSTMENT, STRUCTURED TRAINING PROGRAMS UPON INDIVIDUAL LEARNING, THE PRECEDING TWO ACTIVITIES UPON LATER SCHOOL ADJUSTMENTS AND LEARNINGS, AND PARENTAL ATTITUDES UPON OVERALL CHILD DEVELOPMENT. THE OBJECTIVES OF THE PROGRAM WERE TO PRODUCE INFORMATION RELATING TO THE DEVELOPMENT OF TEACHING METHODS AND MATERIALS, HYPOTHESES REGARDING PATTERNS OF ACADEMIC GROWTH AND SOCIAL ACHIEVEMENTS, AND RECOMMENDATIONS FOR FURTHER RESEARCH IN PRESCHOOL EDUCATION FOR THE MENTALLY RETARDED. CHILDREN WERE DIVIDED INTO EXPERIMENTAL AND CONTROL GROUPS, AND STATISTICAL DATA WERE OBTAINED FROM A CROSS-SECTIONAL, LONGITUDINAL MATRIX OF PHYSICAL EXAMINATIONS, SOCIAL CASE WORK, SPEECH AND DRAWING RECORDS, AND OTHER CLASSROOM REPORTS AND OBSERVATIONS. EARLY IDENTIFICATION TECHNIQUES, PRESERVICE AND INSERVICE EDUCATIONAL PROGRAMS, UNDERSTANDINGS OF SOCIOECONOMIC AND MEDICAL BACKGROUNDS, AND TESTING RESEARCH ARE DISCUSSED IN SUMMARIES OF PROJECT IMPLICATIONS AND RECOMMENDATIONS. (JH)

ED 002796

THE EFFECTS OF A PRESCHOOL PROGRAM UPON YOUNG EDUCABLE MENTALLY RETARDED CHILDREN*

VOLUME I

MEASURABLE GROWTH AND DEVELOPMENT

Maurice H. Fouracre, Professor of Education
Frances P. Connor, Professor of Education
I. Ignacy Goldberg, Associate Professor of Education

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

DEPARTMENT OF SPECIAL EDUCATION
TEACHERS COLLEGE, COLUMBIA UNIVERSITY
NEW YORK CITY

**The Research reported herein was performed pursuant to a contract with the United States Office of Education, Department of Health, Education and Welfare.*

No. SAE6444

1962

MENTAL RETARDATION PROJECT

TEACHERS COLLEGE, COLUMBIA UNIVERSITY

NEW YORK CITY

1957 - 1961

Director of the Study	**Maurice H. Fouracre, Ph. D.**
Assistant Director	**I. Ignacy Goldberg, Ed. D.**
Steering Committee	**Frances P. Connor, Ed. D.** **Maurice H. Fouracre, Ph. D.** **I. Ignacy Goldberg, Ed. D.** **Irving Lorge, Ph. D.***
Teachers College Technical Assistance Group	**Almy, Millie G., Ph. D.** **Brunstetter, Max R., Ph. D.** **Driscoll, Gertrude P., Ph. D.** **Eiserer, Paul E., Ph. D.** **McKillop, Anne S., Ph. D.** **Osborne, Ernest G., Ph. D.** **Raph, Jane Beasley, Ed. D.** **Schonbar, Rosalea A., Ph. D.** **Stobo, Elizabeth C., Ed. D.** **Wann, Kenneth D., Ed. D.** **Witt, Paul W., Ed. D.** **Zimmerman, Jane D., Ph. D.**

*** Deceased, January, 1961.**

3414
53

ACKNOWLEDGEMENTS

This study to determine the influence of group experience upon a sample of young educable mentally retarded children has extended over a period of five years and has involved a large number of individuals and organizations. Our indebtedness to each of them is gratefully acknowledged although only a few can be individually specified.

Gratitude is expressed to Dr. I. Ignacy Goldberg who has served so conscientiously as the Assistant Director of the Project during its last four years and whose handling of the multitude of administrative responsibilities and whose interest and participation in curriculum studies were of prime importance to the operation of the study. Mr. Godfrey Stevens served in this capacity during the first year and assisted in the organization and initiation of the Study.

The contributions of the Research Associates were uniquely different while, at the same time, being consistently valuable. Dr. Frances P. Connor served as the Curriculum consultant and coordinator and, under her direction, the pre-school curriculum was developed and evaluated. Volume II of this report is the result of many hours of painstaking work in developing sequentially a curriculum for young retarded children, and is tangible evidence of the untiring work of Dr. Connor with the able assistance of Miss Mabel Talbot. It is our belief that this curriculum will be an invaluable contribution to the field of mental retardation.

The late Dr. Irving Lorge, Research Associate for evaluation, contributed extensively to the Study from the time of its initiation until his death in January, 1961. The selection of the psychometric test battery, the designing of certain tests, and the coordination of the psychological services were areas of his influence in the Project as well as serving as a member of the Steering Committee. The sudden termination of his participation was a grievous loss to the Study as well as to all those who worked with him.

Serving for briefer periods as Research Associates were Dr. John V. Hottel and Dr. Martin B. Miller, both of whom shared in the computation of data and in some of the statistical analyses reported. And, finally, Dr. M. Leigh Rooke, whose editorial talents were used to bring these volumes to fruition as a finished report.

The teachers who worked with the Project classes, Mrs. Carolyn Astarita, Mrs. Elizabeth Badgeley, Dr. Joan McDaniel, Miss Catherine Sailor, Miss Mabel Talbot, and Mrs. Comilda Weinstock, gave an enthusiasm as well as a devotion to the children and to the development of the curriculum without which the culmination of the study would not have been possible. We also wish to thank Miss Joan Miller, Miss Manijeh Alborz, and Mrs. Elaine Fried for their participation at various times during the five year period.

Closely associated with the important contribution of the teachers was the work of Mrs. Cornelia Belinkoff, social worker; Dr. Ruth Bockner and Mrs. Ruth A. Lipsky, psychologists; Sam Harrison and Miss Rebecca Haskel, language developmentalists; Charles C. Bovee and Dr. Elizabeth Webster, observers; Mrs. Jeanne Ludwig, music consultant; Dr. Virginia A. Powell, pediatrician; and Mrs. Gwen Moskowitz, nurse.

This list would not be complete without a special word of appreciation to Mrs. Ursula Burns, secretary and office manager for the Project, whose constant attention to every detail and whose efficiency and perceptive understanding were a major contribution throughout the duration of the Study.

In addition to the Project staff, sincere gratitude is expressed to the following:

Bellevue Hospital and the staff of the Hearing and Speech Clinic. The Project is indebted for their untiring cooperation in providing all of the audiological evaluations for the children in the experimental programs.

Flower and Fifth Avenue Hospitals and Babies Hospital, Columbia Presbyterian Hospital, for their cooperation and assistance in obtaining referrals of subjects.

The City of New York Department of Health and its staff, who cooperated in the establishment and approval of the Project school as a licensed private school.

The City of New York Board of Education, Dr. John J. Theobold, Superintendent of Schools, and especially the Bureau for Children with Retarded Mental Development and the Bureau of Child Guidance. A special appreciation is given to Miss Katherine D. Lynch, head of the CRMD Bureau, and to her associates, without whose assistance and cooperative efforts the securing of comparison subjects in the public schools and the follow up of Project children who transferred to these schools would not have been possible.

The New York City Council of Social Agencies as well as to the many individual public and private agencies and organizations who assisted so ably in the work of locating subjects and who maintained a consistent interest in this activity despite the additional demands it made upon their time and energies.

The Reliable Transportation Company and its owners, Mr. and Mrs. Harry Berliner, who provided dependable safe transportation for pupils and cooperated in making necessary reports and in giving services beyond those of their contractual agreement.

The Musician's Emergency Fund of New York City who graciously donated to the Study the able services of the music consultant.

Dr. Elizabeth P. Hagen, Professor of Education, Teachers College and Dr. Stanley V. Smith, Program Specialist, State Statistical Services, Office of Education, U.S. Department of Health, Education and Welfare, both of whom gave valuable advice and suggestions, contributing not only extensive knowledge in research and statistics but also in educational methods and practices.

To each of these and to other resource persons not specifically named, the Project has been indebted for services rendered, for cooperation and information.

And, finally, the services, facilities and unending assistance and support of the administration, faculty and staff of Teachers College, Columbia University, made the Mental Retardation Project possible. One of these College contributions was the consultant services of the members of the Technical Advisory Group, who individually and as a committee, provided a valuable specialized resource. Another College contribution was the number of graduate students who, from time to time, served in a variety of capacities as technical assistants.

In conclusion, this Project has been the work of many people and to each one a heartfelt appreciation is expressed.

Maurice H. Fouracre
Head, Department of Special Education
Teachers College, Columbia University

Volume I

TABLE OF CONTENTS

Page

Acknowledgements iii

List of Tables viii

List of Charts ix

Chapter I. Historical Background

Phase I. Planning and Preparation 1
- Rationale for the Study 1
- Project Design 1
- Mechanics for Initiating the Study 3

Phase II. Implementation 4
- Implementation - Stage 1 5
- Implementation - Stage 2 6
- Problems and Limitations 6

Phase III. Compilation of Findings, Analysis and Interpretation 7
- Compilation of Findings 7
- Analysis of Data 7
- Interpretation of the Findings 8

Chapter II. Case Finding and Selection of Subjects 9

I. Experimental Class Participants 9
- Review of Literature 9
- Criteria for Selection of Subjects 10
- Case Finding 10
- Referrals to the Project 11
- Procedures for Referral and Admission 13
- Uncontrollable Variables Related to Subjects and Referrals 13

Page

II. CRMD Comparison Participants 14
Criteria for Selection 14
Procedures for Identification of CRMD Subjects 15
Family Reactions to Project Participation 15

Chapter III. Subjects of the Study 16

I. Characteristics of the Participants 16
Experimental Class Subjects 16
Comparison Group Subjects 20

II. Case Studies of Experimental Subjects 23

Chapter IV. Instruments and Techniques of Evaluations 33

I. Techniques and Procedures for Evaluation of Subjects 33
Experimental Class Subjects 33
Comparison Group Subjects 37

II. Techniques and Procedures for Program Evaluation 38
Curriculum Effectiveness 38
Comparative Data 39

Chapter V. Results of the Study: Report on the Analysis and Interpretation of Statistical and Descriptive Data 40

I. Report on Statistical Results 40
Chronological Ages 40
General Intellectual Ability 40
Specific Abilities 44
Speech and Language Development 48
Social Development 48
Pupil Growth and Achievement 50

II. Report on Related Findings 53
Classroom Observations 54
Parent Attitudes 56

Chapter VI. Results of the Study: The Experimental Pre-School Curriculum 62

Curriculum Rationale 62

The Exploratory Stage of Curriculum Development 63

Development of the Curriculum Guide 64

Page

Use of the Guide 64

Classroom Implementation: Action Settings 65

Programming the Curriculum Guide 65

Teacher Evaluations 67

Summary 67

Chapter VII. Summary, Implications and Recommendations 68

Summary 68

Implications and Recommendations 69

Bibliography 71

Appendix A 73

Appendix B 89

Appendix C 102

Appendix D 116

List of Tables

Page

1. Summary of Case Finding Resources and Referrals Made by Medical, Educational, Social and Other Organizations and Services to Mental Retardation Project, 1958-1961. 12

2. Distribution of General Characteristics of Subjects Completing Program in Mental Retardation Project Experimental Classes, 1958-1961. 17

3. Distribution of General Characteristics of CRMD Comparison Subjects in Mental Retardation Project, 1958-1961. 21

4a. Mean Chronological Ages for All Subjects, Reported by Project Completion Year and for Total Participants according to Socio-Economic Groups, 1958-1961. 41

4b. Distribution of Chronological Ages (year-month) at Time of Admission for Project Subjects who completed the Experimental Program and CRMD Subjects in Comparison Group. 41

5. Mean Scores on Revised Stanford-Binet, Form L, and Merrill Palmer at three Testing Periods for Experimental and Comparison Subjects According to Socio-Economic Levels 43

6. Mean Scores on Revised Stanford-Binet, Form L, and Revised Columbia Mental Maturity Test for Experimental and Comparison Subjects According to Socio-Economic Levels. 44

7. Comparison of Project Designs Test Mean Scores with Mean C.A., M.A. and I.Q. for Experimental and Comparison Subjects, 1958-1961 45

8. Comparison of the Mean Point Scores on the Weights Test for Experimental and Comparison Subjects, 1958-1961. 47

9. Test-Retest Correlations for Sequential Periods on Teacher and Parent Social Development Inventory Scores. 49

10. Effects of Repeated Ratings on Developmental Curriculum Scale Sub-Scales for Experimental Subjects in the 1960 and 1961 Classes (based upon mean Ratings for Clusters of Items in each Sub-Scale). 50

11. Placement of Experimental Subjects at End of Project Participation: A Four Year Follow-Up. 52

12. Major Concerns Expressed by Parents About their Mentally Retarded Children Participating in the Experimental Pre-School Program. Parts I and II. 58

List of Charts

Page

1. Mean Changes in Mental Ages for Experimental and Comparison Subjects Obtained from Sequential Testings with the Revised Stanford-Binets, Form L, 1958-1961 42

2. Mean Changes in Mental Ages for Experimental and Comparison Subjects Obtained from Sequential Testings with the Merrill-Palmer Scale, 1958-1961 44

3. Mean Changes in Scores on Color Pointing Test (Color I) for Experimental and Comparison Subjects, 1958-1961 46

4. Mean Changes in Scores on Color Matching Test (Color III) for Experimental and Comparison Subjects, 1958-1961 47

5. Mean Ratings for Each of the Seven Sub-Scales of the Developmental Curriculum Scale for the 1960-1961 Experimental Subjects for Six Sequential Rating Periods, 1959-1961 51

CHAPTER 1

HISTORICAL BACKGROUND

Phase I - Planning and Preparation

Rationale for the Study

Historically, there is a dearth of any conclusive information on the development of children identified as mentally retarded at the preschool age. This condition has continued during the last several decades, despite the mounting contributions made by studies of intellectually normal children in nursery and kindergarten programs. In contrast, studies of the learning of mentally retarded children have been largely concentrated in the school age population, with admission to special classes for children with sub-normal intellectual ability either discouraged or prohibited earlier than age seven. Initiated in 1957, the Mental Retardation Project here reported was an attempt to study the influences of group experience on a sample of young children who would be expected usually to become eligible somewhat later for admission to New York City public school special classes for children with retarded mental development.

The major concern of this Project has been to determine whether or not nursery-kindergarten experiences with a competent teacher will further the assimilation of young retarded children in public school classes. The focus, therefore, has been upon the program and the children participating in it. A curriculum that will help children of this age and ability to grow and live in their society has been a primary area of study. The design of the project, a cross-sectional-longitudinal overlap study, has been deemed appropriate for pursuing the objectives stated.

Project Design

The objectives were premised upon the hypothesis that there could be positive results from nursery-kindergarten classroom experiences both in the immediate and in the subsequent behavior and adjustment of four to six year old children diagnosed as educable mentally retarded and having I.Q.'s between 50 and 75, but who were free from serious identifiable physical or emotional handicapping disabilities.

The initial plan for the study defined the objectives as:

(1) To discover the amount and kinds of learning within the classroom; e.g., activities in daily living, academic learning and readiness, social and emotional adjustment, speech development, listening skills, oral comprehension, and vocabulary growth.

(2) As a consequent of (1) above, to determine appropriate curriculum and teaching methods in classroom settings for preschool educable mentally retarded children.

(3) To evaluate the subsequent adjustment at or near age 7-8 years after admission to a public school program in the same range of activities in (1) above.

(4) As a control, to compare periodically learnings and adjustments of 4 and 5 year old mentally retarded children who remained at home with those attending a classroom program.

(5) To compare periodically the learnings and adjustments of both groups of children at 6, 7 and 8 years while attending a public school program for the mentally retarded.

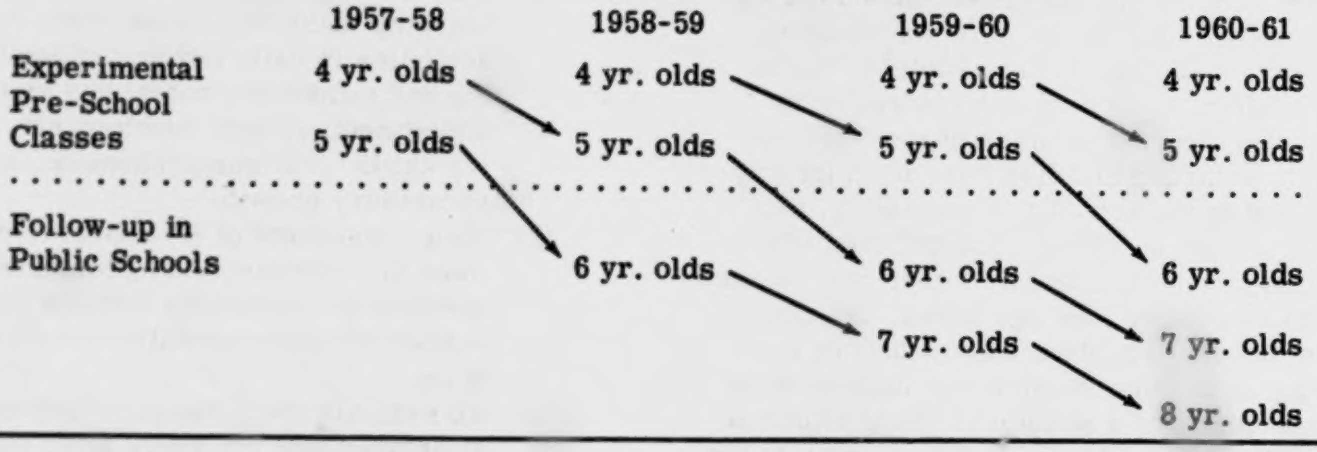
(6) To compare the developmental sequence of educable mentally retarded children with that of the so-called normal. Particular attention to be given physical, social-emotional, and speech developmental patterns.

(7) As a concomitant to the effects to be studied, to evaluate growth and development of these children as a function of the degree of parental acceptance of the children's deviation.

In order to implement these objectives, the initial plan for conducting the research was described as follows:

"A sample of approximately 60 children, C.A. 4 years, 9 months to 6 years, 9 months, diagnosed as educable mentally retarded (I.Q. 50-75) by an independent hospital clinic. About thirty of the children [group S (School)] will be provided group experiences in a classroom setting. The other thirty children [group H (Home)] will remain at home. Parents of group H will have received, through the hospital clinic, basic instructions for care of their children at home. It is hoped that an additional thirty children remaining at home with no planned parent instruction will serve as a null group (group N).

"A long range cross-sectional-longitudinal overlap study will cover a four year period. During the first year, group S will be divided into two classes differentiated by chronological age. At the end of the first year, the older children should be eligible for public school placement, the four year olds will progress to the five year group and a new group of four year olds will be admitted to the pre-school pilot program. These promotions will continue through 1960-61 at which time the five groups of children will be under study. Three of these (6, 7, and 8 year olds) will be in the public schools; two groups (4 and 5 year olds) will be in the pre-school pilot program. Concurrently comparable groups of children with no pre-school organized group experience will be studied.



During this investigation, several kinds of data were specified to be obtained, including (1) descriptions of curriculum and classroom procedures used with the pre-school mentally retarded children; (2) medical evaluations; (3) psychometric appraisals; (4) measurements of variations in personality and social maturity; (5) language development reports; (6) academic readiness inventories; and (7) measures of parental acceptance. Evaluation techniques delineated for these purposes were: physical examinations, social case work, systematic recordings of spontaneous and controlled speech, psychometric tests and measurements, anecdotal records of class activities and child behavior, teacher plans, and independent observations. (Detailed information concerning the evaluative techniques utilized during both the initial child study and regular periodic appraisals is reported in Chapter Four, Instruments and Techniques of Evaluation.)

It is important to bear in mind that, throughout the pre-planning for this study and continuing into the early stages of its implementation, there was an undeviating assurance by medical clinics, mental retardation centers and consulting advisors that subjects for the Project could be readily available in a large metropolitan center of 8,000,000 persons. Such did not prove to be the case insofar as pre-school educable mentally retarded children meeting the acceptance criteria were concerned. (A full report of the case finding activities will be found in Chapter 2, Case Finding and Selection of Subjects.) For this reason, certain editing of the Project plan was necessary, eventually formalized in an official revision in September, 1959.

The revised plan maintained as constants the basic objectives as well as the techniques being employed, although certain procedural modifications were effected. Originally, it was proposed that at least two groups of approximately 30 children each would constitute the experimental (school) group and the control (home) group. A third group, suggested but not stipulated, would have neither school program nor home counseling, thereby making possible an additional control as a null group. When, despite herculean efforts to obtain referrals and to identify those young mentally retarded children who could meet the selection criteria for the study, the supply of subjects had fallen far short of the projected numbers, certain modifications in the Project design were evolved.

In so far as the objectives for the study were concerned, the basic anticipated outcomes remained essentially unchanged, but the original plan pertaining to the 4 and 5 year olds who would remain at home was deleted. Subsequently, a comparison group was instituted at the 7 and 8 year old level, utilizing children in the public school classes for those with retarded mental development. Since these children would be selected to comprise a group who had not had previous comparable nursery and/or kindergarten, but who could be assumed to have met the criteria for eligibility to participate in the Project experimental program, their progress and development in the public school program could be evaluated and compared with that of the seven and eight year old children transferring from the experimental class into the New York City public school special classes. With the exception of this modification, other aspects of the study and its procedures and techniques remained the same.

Throughout the course of this investigation, February 12, 1957 to June 30, 1961, all aspects of study and the methodology employed have been directed toward a two-fold end product, namely,

(1) Development of appropriate teaching methods and materials for use with pre-school educable mentally retarded children.
(2) Delineation of hypotheses regarding the developmental patterns of growth and achievement in pre-school educable mentally retarded children based on interpretation of the longitudinal data gathered concerning the children participating in the Project.

In view of the limited information available about the effects of group training for four and five year old children who are mentally retarded, it has been anticipated that there would be another important outcome from the study, namely,

(3) Recommendations for further research on pre-school educable mentally retarded children based upon interpretation of the longitudinal data available.

The Mechanics for Initiating the Study

The contractual agreement under which this Project was authorized delineated the scope of the study and the obligations committed by both grantor and grantee. The implementation of the Project required definition of policies, orderly procedures, qualified personnel, physical facilities and the selection of essential criteria, guidelines, tools and techniques.

Organization, Policies and Procedures. This study was conducted on the campus of a large teachers' college where the college faculty as well as the university resources in education, nursing, psychology, and speech were readily available. In addition to the facilities of the university, the resources of New York City include major diagnostic clinics, well organized and active parent groups and a multiplicity of public and private agencies and services.

Within this framework, an Advisory Committee (Steering Committee) was established, comprised of the director of the Project, the assistant director and two research associates, one responsible primarily for the curriculum aspects of the study and one for the evaluative aspects. The assistant director coordinated all of the Project activities at the administrative level. This organizational pattern provided for coordinated responsibility, permitting maximum use of personnel skills in planning and executing the study while, at the same time, affording sufficient flexibility to permit necessary modifications. A second and less formally structured committee has been the Technical Assistance Group comprised of authorities in particular areas of educational specialization. Upon the request of the director of the Project, this group, either collectively or individually, were available to work with the Advisory Committee and the Project staff in the development of various aspects of the study and for consultant service.

As procedural developments were effected, an organizational manual was begun to serve as a repository for formalized policies, procedures and directives in an effort to insure continuity and orderly functioning for a long term study. This manual later became a record of project activity as well as a basis for in-service training of new personnel joining the staff and for new members of advisory groups.

Personnel. At first the Project staff consisted of a director, assistant director, social worker, language developmentalist, two research associates and a secretary. There also was a working arrangement with the Mental Retardation Clinic of Flower and Fifth Avenue Hospitals which served as the case referral source and provided medical and psychological information for screenings and evaluations.

As early as the Spring of 1957 it became apparent that the single referral agency could not provide the subjects needed according to the criteria specified, and more extensive contacts became necessary. At the time that case finding became a broadened Project activity, the services of a pediatrician and a psychologist were added. By September of that year, the staff had been expanded further to include two teachers (one, the teacher-in-charge), two teacher aides (later, these positions were designated as teacher assistants and part-time teachers), two observers, and a clerk. As more children became involved, additional psychometric services were provided. It was possible to supply some of these staff members through the use of part-time graduate students as research assistants in such positions as teacher aides and assistant teachers, observers and psychometrists. During the latter phase of the study, the full time pediatrician was replaced by a Project consultant pediatrician for the initial screenings. In the last year, a nurse was employed as a member of the staff.

Beginning in the Fall of 1959, the services of a music consultant were contributed to the Project by the Musicians' Emergency Fund, Inc., of New York City. The music consultant made regular weekly visits to the classes, working with the children and serving as a special resource to the teachers.

Facilities. Both the Project offices and the experimental classroom were housed in the College with space remodeled for this purpose. The offices were conveniently located in close proximity to the classroom. Auxiliary physical facilities made available by the College included a gymnasium, exercise room and swimming pool, a home economics suite and a roof play area with appropriate equipment. Previous reference has been made to use of the Mental Retardation Clinic of the Flower and Fifth Avenue Hospitals, and in addition, Bellevue Hospital provided otological examinations for Project class enrollees.

The experimental classroom was designed to meet the purposes of the study, fulfilling the requirements also of the New York City Board of Health which licensed this facility as an approved private child care center. This room is similar to regular classrooms for young children, i.e., nursery or kindergarten, including such features as running water, extensive storage space, 50 foot candle lighting at table top height, acoustically treated ceiling and smooth, nonabsorbent floor covering. The actual size of the room is 31 x 24 feet exclusive of a generous alcove area. Immediately adjacent to the classroom is an air conditioned observation booth equipped with a one-way vision window, a recording installation and speaker to transmit sounds from two microphones in classroom. These latter provisions facilitated extensive observation without any interference with class activities. In close proximity to the classroom was a lavatory. These facilities accommodated two classes, a younger group from 9 a.m. to 11:30 a.m. and an older group from 1:30 p.m. to 4:00 p.m.

As a facilitating service, the Project provided pupil transportation to and from school within a geographical area of reasonable proximity to the location of the experimental classes. Through a contractual arrangement with a private transportation service, the children were brought from their homes to the school and returned at no financial cost to the parents.

The School Year. Since this was a research study and not a service project, the school calendar reflected the difference. Non-attendance days for children were set aside for meetings of teachers with consultants and for other interdisciplinary activities. The actual class days were 165 a year, beginning in September, 1957.

Evaluations. From the time of the first screenings of subjects and throughout the duration of the study, regular routine and periodic evaluations were made. The techniques employed included tests, scales and observational records and ratings in the following areas:

Intellectual
Social and Behavioral
Sensory - Motor
Learning Readiness
Speech and Language
Health

The patterns of use for these evaluative tools varied according to the individual plan and schedule for the various groups, i.e., experimental class, follow-up of former class enrollees, and comparison group. The most intensive evaluations were those on-going with children in the two experimental classes. (A detailed report on all aspects of the evaluative tools and techniques is given in Chapter 4.)

Phase II - Implementation

The phase of the study designated as the period of implementation, September, 1957 to June, 1961, is the time during which the experimental classes were in operation, and an active training program with children as well as an evaluation of the effects of that training were ongoing. For purposes of reporting, this period has been divided into two stages, Stage 1, from September 1957 to September 1959, and, Stage 2, from September 1959 to September 1961. It is fully realized that these two stages are not complete entities each separate and apart from the other, but rather there is a great deal of overlap, with changes evolving gradually. Recognizing this, the first stage is closely identified with the initial Project design and planning although modifications began early as conditioning situations pointed the need. The beginning of the second stage is marked by official approval of the revision in the Project design in September, 1959.

Implementation - Stage 1

Experimental classes. By September, 1957, or the beginning of Stage 1, the selection of subjects had progressed to the point that a sufficient number of children were available for the two classes, one group ages 4 years 9 months to 5 years 9 months and a second group ages 5 years 9 months to 6 years 9 months. All children were not enrolled simultaneously, but each class opened with a nucleus of seven children and others were admitted gradually until a total initial enrollment of 27 was reached. There were 14 in the younger group and 13 in the older, which closely approached the planned maximum enrollment of 15 children in each class.

Initially, there were two teachers (one a teacher-in-charge) and two teacher aides. During the first year it was found that the idea of a teacher-in-charge to handle scheduling, supplies and similar chores was not a practical one. Instead, each teacher could better handle these matters for her own group since the classes were not in session at the same time and the Project administrator, the assistant director, was readily available for assistance when needed.

The program was developed on the basis of a nursery school curriculum with teacher emphasis consistent with identified child needs. For the first several months, a child study committee worked together regularly toward the goal of a better knowledge and understanding of the children. The membership of this group included: teachers, social worker, pediatrician, psychologist and the language developmentalist. The last named member of the committee, the language developmentalist, served a somewhat dual role in that he was responsible not only for the development and selection of tools and techniques and for the administration of evaluative tests, but he also worked actively in the classes in the development of language.

A Curriculum Study Committee also was organized which directed its efforts toward the development of a nursery-kindergarten curriculum suited to the needs of young educable mentally retarded children. The curriculum committee continued its work throughout the study.

Closely allied with the organized efforts to understand the needs of the children and to develop an appropriate curriculum, there was a systematic schedule of recorded observations which utilized two research assistants. The techniques for observation included checklists, anecdotal reports and taped records of the classroom activities. These records have afforded a study of child behavior during various aspects of the curriculum as well as interaction on the three levels of teacher-child, child-child, and teacher-teacher.

An emphasis upon evaluation and reevaluation has permeated each stage and each aspect of the Mental Retardation Project. Beginning at the time of determining eligibility for the study and continuing throughout the experimental class program and the follow-up period, the children have been studied medically, psychometrically, in the areas of speech and language as well as in relation to their home environment. (See Chapter 4, Instruments and Techniques of Evaluation.)

During this first stage of implementing the study, a specific system of records was put into operation, with the specialized staff in psychology, social work, speech and language, curriculum and teaching responsible for maintaining and recording clearly defined predetermined categories of information.

The Comparison Group. In the early conferences with public school officials, and specifically with officials from the Bureau of Child Guidance and the Bureau of Children with Retarded Mental Development, a cooperative plan was worked out between the Mental Retardation Project and the New York City Public Schools. These arrangements included not only the orderly transfer of children from the Project into school programs, but also the study of selected enrollees in the classes for Children with Retarded Mental Development.[1]

Through a study of individual pupil records, a screening of those thought to be eligible using the criteria of the Project, and a detailed evaluation of selected candidates, it was insured that a public school group similar to the experimental class enrollees would be located. Through age-matches, the transferring Project pupils and those in the public school programs were reasonably comparable. After the comparison subjects were identified, they continued in the regular school program to which they were assigned with the addition of routine periodic evaluations. This same evaluative procedure was established for the children transferring from the Project to the public schools. At this time, three groups of children were being studied, experimental, follow-up and comparison.

---

[1] Hereafter, the designation of Children with Retarded Mental Development may also be abbreviated as CRMD.

Implementation - Stage 2

Modification of Project Design. It is at this stage in the Study that the home and control (null) groups disappeared from the Project design. Insofar as the groups of children studied were concerned, this stage began not unlike the first ended. While the original design had implicit in it a strong focus upon curriculum, this emphasis was clarified further in the revision.

In the Project classes, the older group for the 1957-58 school year had transferred out, becoming the first follow-up group from the experimental program. The younger group replaced that class and a new younger group were admitted. This procedure was repeated for each succeeding year, with the follow-up group increasing and a new beginning class being admitted. There still existed the difficulty of numbers of subjects.

At this time, there were two teachers and two teacher assistants, giving one full time teacher and one part-time in each group. Classroom routines had been established and classroom programs, curriculum development and evaluations were proceeding according to plans and schedules. The curriculum guide now had been proposed and put into use. The first follow-up class had been matched with a CRMD comparison group, thereby marking the beginning of this portion of the study and the involvement of public school staff in a cooperative undertaking.

Emphasis upon Curriculum. Curriculum development was a primary concern, with the classes serving as a practical laboratory for testing hypotheses relative to more effective methods and materials. The curriculum advisor for the Project took an increasingly active role in this primary aspect of the study, working regularly with the teachers in their curriculum work sessions held at least twice a week. Throughout Stage 2 of the study the focus on curriculum was undeviating. In addition to the curriculum leadership afforded, other aids for program development were secured. Earlier, reference was made to the physical facilities for the study, which included the use of a swimming pool and a home economics suite. It was at this time that these two provisions were made available on a definite schedule, providing a consistent and valuable program enrichment.

Coordination of Personnel Efforts

Generally speaking, the staff had benefited from the first year of working as a team, and individual roles now were more clearly understood. Each year after the first there was a nucleus of familiar children for whom observations and other evaluations were beginning to show patterns of change, and staff identity with these constituted a strength. There was increasing participation by the staff in professional meetings, where often the need to present the Project program to others served to give additional clarity to the participants themselves.

Work with Parents

Throughout the study, there were regular parent meetings at the school, providing an opportunity for parents to discuss their views and problems and for parents and teachers to exchange information. These meetings were usually well attended by both parents and the interaction among parents and teachers contributed substantially to understanding the children, the roles of both parents and teachers, and the nature of the handicap itself.

Increasingly, the Project became identified in the community, both the college community and the City. Not only did students from a variety of disciplines visit and observe, but public school staff associated with the Project came to see the classes, to ask questions and to gain insight about it. Other visitors came from agencies, medical services and interested groups in the City as well as from all parts of the United States and foreign countries.

Problems and Limitations in the Study

1. Case Finding. Arising as an early problem and continuing throughout the study, the securing of subjects according to criteria established was an ever present concern. The revision of plans, the editing of procedures and the constant reappraisal of methodology which resulted from this difficulty may, in retrospect, seem to have had some advantages as well as disadvantages. It is unquestionably true that this facet of the investigation has had a constant influence upon every phase of the study.

2. Public School Admission Policy. At the time this study was initiated, the 4 years 9 months to 6 years 9 months age group was not eligible for admission to the New York City public school CRMD program on the simple basis of chrono-

logical age. After the Project was begun, a New York State statute mandated the lowering of the age for admission to 5 years. This development served to remove for the general public as well as for some agency representatives one clear difference between the experimental classes and the public school provisions, although the subsequent enrollment of these young children in the public schools was small.

3. Geographical Eligibility. Associated with the problem of numbers of subjects was another pertaining to the nature of the geographical area and its attendant restrictions. Despite the shortage of eligible subjects, there were some who were acceptable to the Project and could not be admitted because of transportation limitations. Their inaccessibility prevented their inclusion in the experimental classes. While this number was not large, it presented a concomitant problem to that of case finding.

4. Staff. The availability of professionally qualified persons in a large metropolitan area and in a university community is not an obstacle, but certain intangible difficulties do present themselves. One is the necessity of welding a variety of professional disciplines into a working team, each with full understanding not only of his own role but also of the complimentary roles of the other staff members. Paralleling the difference in professional emphasis is the service-therapeutic orientation of each of the professions involved in this study, rather than a research orientation. The development of inter-disciplinary understanding and a research "point-of-view" within the total Project staff demanded a constant awareness on the part of the Project administration as well as an on-going in-service program.

During the second phase of the study, there were a number of personnel changes resulting from a variety of reasons, among which were, part-time graduate student research assistants who completed their studies and left the college; illness; personal reasons necessitating a change; and one death. The influence of these personnel changes upon the Project varied from a negligible effect to one requiring extensive adjustment and a reapportionment of responsibility.

Despite the existence of problems during Phase II, the staff now had learned to work together and to know the human resources within their own group. As a result, there was greater confidence both in the worth of the work and in the ability to accomplish it.

5. Experimental Subject Changes. The withdrawal of children from the Project by their parents and the failure of eligible children to enter the classes continued. Although there was no obligation to continue participation after admission, these changes did result in experimental class attendance ranging from several days to the full two years. A corollary to this was that several children who appeared to meet all requirements for the program were found, upon admission, to be unable to adjust to the group and were excluded.

In short, problems did exist throughout the study and, in some instances, initial problems continued, i.e., case finding. During the latter months, however, those arising were largely of a more routine nature, lacking the disquieting effects of new difficulties in a new situation. Counterbalancing these was the fact that the staff had come to know better their own resources in problem solving which resulted in an increased confidence.

Phase III - Compilation of Findings, Analysis and Interpretation

Compilation of Findings

The records maintained throughout the study have been compiled and edited in order to screen out extraneous materials. Meaningful findings, both positive and negative, have been compiled for each aspect of the Project. These data are in the following categories: medical findings, psychological evaluation reports, social case work records, systematic recordings of spontaneous and controlled speech, sequential records of drawings, anecdotal reports of classroom activities and behavior of children, learning achievement, and recorded observations.

In addition to these formally recorded evaluative data, a large body of information has been accumulated which has pertinence. These sources included management records of operational procedures; monthly, quarterly and annual reports; minutes of committees, staff and advisory groups; and elaborately detailed case records; as well as interim statistical computations, and staff working papers. These have been studied and their worth assessed. In each case, they have served as a retrospective chronological review of the Project.

Analysis of Data

In order to determine the significance of the findings reported, the analysis of data has included, (1) content analysis of productions, (2) pattern analysis wherever feasible, and (3) the following small sample statistical techniques: product moment coefficient of correlation, t tests, analyses of variance and covariance, difference

between means. Graphic plots of reported measurements also have been used. (The report of the results of these analyses is given in Chapter 5.)

Interpretation of the Findings

Each category of the data has been analyzed with a two-fold purpose, (1) to determine any relationships which exist, either positive or negative, and, (2) to identify those areas in which there appear to be relationship, not established, but which indicate need for further study. Included in the latter are those findings yielding no statistical significance, but which do give an indication of trends. Closely allied to these goals and, in fact, interrelated with them has been the use of the total analyses of data in drawing inferences with respect to possible effects upon the preschool curriculum and upon the child participating in it.

CHAPTER 2

CASE FINDING AND SELECTION OF SUBJECTS

I. EXPERIMENTAL CLASS PARTICIPANTS

The Mental Retardation Project was designed to investigate the effects of group training for young educable mentally retarded children, and it did not propose to study the prevalence of these children in the population. Prior to the inception of the study, knowledgeable sources repeatedly gave assurance of the ready availability of suitable subjects. It was on the assumptions, (1) case finding would be a routine accepting of referrals, and (2) the selection of participants from these referrals would be simply choosing candidates according to established criteria, that the Project began. This was not the case. As has been reported earlier, the problem of case finding and the continuing struggle to secure a sufficient number of eligible subjects to maintain the Study have been a constant concern of the Project staff. At times, this concern has dominated all others.

Although the difficulties of identification already had been established in less populous communities, it was not anticipated that it could apply to New York City as well because of its large and concentrated child population.

Review of literature

Kirk[2] reports that a search for similarly handicapped young children which began in the Fall of 1948 in Champaign, Illinois, had yielded only five children by January, 1949, and a total of only fourteen by the following Fall. He concluded that, "It was impossible to find a sufficient number of educable mentally retarded children at the preschool level in a single community of approximately 70,000 to supply subjects for both an experimental and a control group."

In an identification study in a community in Virginia[3] in 1955, based upon referrals of children known or thought to have disabilities, only fourteen children, roughly 4 per cent of the mentally retarded reported, were under six years of age, including both the moderately and severely mentally handicapped. The population here was approximately 157,000.

The Onodaga special census study report[4] showed that, "prevalence (of mental retardation) is lowest in the youngest ages . . ." For the three age groups: under one year, one and two years old, and three and four years old, it was stated that "the age-specific prevalence rates were 2, 4 and 6 per 1000" respectively. "At age 5, prevalence rises very sharply to about 22 per 1000; then almost doubles in magnitude to nearly 40 per 1000 at age 6. The sharp increases in prevalence most likely reflect the introduction of a new major source of referral — the school system."

A preponderance of studies reported in the area of prevalence of mental retardation in the child population have actually been concerned with school age children. In instances where young retarded, as well as those with other types of disability, are sought, reliance upon referrals by physicians, public health nurses, social workers and other service organization staff has been a somewhat consistent pattern. The results found by the Mental Retardation Project with regard to referral sources have been similar to those reported by Kirk, in that social agencies tend to refer on the basis of difficult home conditions and domestic problems, while physicians refer on the basis of marked defectiveness, usually organically caused. In neither case do the referrals generally yield educable mentally retarded children without serious and complicating ancillary handicaps.

---

[2] Kirk, Samuel A. Early Education of the Mentally Retarded. University of Illinois Press, Urbana, Illinois, 1958. p. 13.

[3] Rooke, M. Leigh. An Evaluation of Two Methods Used to Locate Handicapped Children in the Commonwealth of Virginia. Unpublished doctoral dissertation, Teachers College, Columbia University, N. Y. 1956.

[4] A Special Census of Suspected Referred Mental Retardation in Onodago County, New York. Community Mental Health Research, New York State Department of Mental Hygiene, 1955.

In effect, all evidence supports the conviction that these youngsters are not easily identifiable until their disability becomes an educational problem.

Because of the difficulties found, a more detailed report is given here of the method and procedures used in case finding, the resources tapped, the relative productivity of these resources and the attitudes encountered.

Criteria for Selection of Subjects

The criteria for admission evolved through a three stage process, beginning at the time the Project was designed. First, there was a broad generalized statement defining the age group and the mental ability level. Next, guidelines for establishing firm criteria were given which covered chronological age, clinical recommendation, psychometric data, physical condition, speech and language, and emotional stability. As a third and final step, the criteria were refined and accepted as the basis for selection of participants in the Mental Retardation Project. These criteria were:

1. Residence: The child must live within the established transporting distance of Teachers College, Columbia University.
2. Chronological Age: The child must be between the ages of 4 years 9 months and 6 years 9 months as of September 1 of the year he is admitted.
3. Sex: Both boys and girls are eligible.
4. I.Q.: The I.Q. must fall between 50 and 75 at the time of psychometric examination administered by the Project psychologist. (During the first year of the study this requirement was qualified to permit a decision concerning presumed potential intellectual functioning on the basis of the psychologist's clinical judgment.)
5. Physical Status: At the time of examination by the Project staff the child must be:
    a. in good physical health.
    b. able to walk without assistance.
    c. free of physical disorders which would require restriction of activities (e.g., heart disease, major convulsive disorders, asthma, etc.)
    d. fully toilet trained.
    e. free of major visual or auditory handicaps.
    f. free of major speech and language dysfunction.
6. Emotional Status: Evidence of severe emotional disturbance or psychosis will disqualify a child from participation in the Study.
7. Family Participation: The Project considers it essential to study the background and developmental history of each child as well as the family constellation. Therefore, family cooperation must be assured.

Ancillary to the above selection factors was the provision that each child would be considered individually on the basis of both the criteria stated and the clinical judgment of the Project staff, i.e., whether an ancillary disability constituted a restrictive handicap.

The purpose of each of the criterion used was supportive of the research orientation of this experimental training program in contrast with the service function of the usual school program. It is against this background of selective eligibility that case finding must be considered.

Case Finding

At the time the study was planned, a single referral source was anticipated, namely, the Mental Retardation Clinic of Flower and Fifth Avenue Hospitals. After a review of 2,000 case records, yielding 50 possible referrals and only 16 eligible candidates for the Project, it early became apparent that the single source could not supply a sufficient number of suitable candidates. Then, Babies Hospital, Columbia Presbyterian Medical Center, was added as a second source of referrals. When this did not solve the problem, extensive contacts were made with all possible known sources, including medical, educational, social agency, service organizations, parent association and informed individuals with extensive community knowledge. During the first year, over 900 organizations, clinics, agencies and associations were reached by direct contacts, and these were exclusive of an unknown number of individuals and groups informed by selective use of mass media, i.e., professional journals, bulletins. The distribution of contacts was as follows:

Type of Contact	Number
Child health stations and Dept. of Health subdivisions	54
Private health organizations	44
Pediatric, psychiatric, orthopedic, metabolic and speech clinics	120
Independent mental hygiene clinics	21
Pediatricians and psychiatrists	45
Medical societies	5
Private nursery schools and day care centers	122
Public and private schools	118
Local colleges and professional schools	12

Type of Contact (Continued)	Number
Departments of Welfare	4
Family agencies	6
National relief organizations	5
Child placement agencies and child care organizations	13
Correctional agencies and courts	18
Settlements and community organizations	140
Camp and recreational agencies	21
Churches and denominational organizations (Protestant, Jewish and Roman Catholic)	62
Foundations	12
Private and public institutions	38
City, State and National Departments of Housing, Labor, Education and Health	20
Trade and professional organizations	22
Civic and fraternal organizations	4
Parent organizations	4
Total	910

Because the Project was located in uptown New York City, it was in the midst of an elaborate network of medical, social, educational and other service centered organizations. In addition, there was a ready access to all types of social agencies through the City's well organized Council of Social Agencies. Because of the wealth of resources, the referral responses present an interesting pattern both in numbers and in types.

Referrals to the Project

Medical sources. A preponderance of medical and nursing services and the physicians contacted did not make referrals, although a number did reply to the Project inquiries. Among the responses received were: (1) a majority of the retarded children they see are too severely handicapped to be considered in the Project; (2) their patients have secondary handicaps, such as crippling conditions, schizophrenia, etc., which render them ineligible; (3) most of their patients who are within the educable range of mental retardation are never seen prior to age eight or older; (4) in the case of the independent mental hygiene clinics, they do not treat mentally retarded patients and, therefore, have little contact with them, and finally, (5) the lack of psychological diagnostic services in a number of the clinics created a reluctance on the part of the staff to make referrals (See Table 1 for a tabulation of medical referrals and the extent of their eligibility.)

Educational Sources. In the case of the schools, public, private and special, the limited availability of psychological reports for children thought to be retarded constituted a deterrent to referrals. For young children enrolled in public school kindergartens, this was almost consistently true since the testing services of the New York Board of Education's Bureau of Child Guidance are not provided until after the age of seven years. Private nursery schools reported that they seldom see retarded children. (See Table 1 for numbers referred.)

Social agency and social service sources. With the assistance of the Community Council of Social Agencies, all member agencies of the Council were reached either by personal contact, by letter or by notices in publications. This information coverage was further extended through the cooperative effort of several religious service organizations. Measured in numbers of referrals, however, the general response of the social agencies as a whole was less than had been expected.

Among the reasons given for the paucity of children referred by these sources were: (1) After reviewing the case loads of all centers in all boroughs "not a single child fitting the criteria" was found. (2) The retarded children they see are severely handicapped. (3) The staff did not consider themselves qualified to make referrals. (4) They deal with older children and do not know their families. (5) They consider it outside the province of their jobs to refer families anywhere for service. (6) A few felt they were seeing mentally retarded children, but, for the most part, the disability was not recognized by the parents and the case workers would not risk relationships by suggesting it. (7) Their clients were seeking all day care. (8) They felt parents would be unable to provide necessary records. As a generalized observation associated with the voiced reactions of the representatives of social services and agencies, there did not appear to be an awareness of the condition of retardation in their service populations nor any strong indications of interest in identifying these children. (See Table 1 for numbers of referrals.)

Other Sources. These resources to the Project, largely the Association for the Help of Retarded Children and the Parent Association of the Bureau for Children with Retarded Mental Development, were a steady source of referrals. A striking difference between these and other sources was that they had a keen interest in and an informed knowledge of mental retardation. Children known to such groups were available in generous numbers, but, unfortunately, a majority were ineligible under the Project criteria. (See Table 1 for numbers of referrals.)

Table 1

Summary of Case Finding Resources and Referrals Made
by Medical, Educational, Social and Other Organizations and Services
to Mental Retardation Project, 1957-1961

	Referral Sources				
Referral Action	Medical	Educational	Social	Others	Total All Sources
Total No. Referrals	452	170	56	95	773
Disposition of Referrals:					
No. who did not apply	43	93	6	9	151
No. ineligible before screening	271	27	25	25	348
No. ineligible after screening	87	25	14	48	174
No. Parents withdrew during screening	9	2	1	2	14
No. eligible and admitted	42	23	10	11	86
No. parents withdrew after admission	10	1	1	1	13
No. Project excluded after admission	13	0	0	0	13
No. children who did not complete program	2	3	1	0	6
Total No. Referred and completed program	17	19	8	10	54

Relative Productivity of Referral Sources. The total referrals made for the Project experimental classes from all sources were 773 with roughly 11 per cent of these meeting the admission criteria. There were 14 children for whom it is not known whether they met the criteria because their parents withdrew them during the screening process. This is not regarded as a critical factor, however, for, had all 14 proven to be eligible for participation in the Project, they would have raised the percentage of those meeting the criteria by less than 2 per cent.

Insofar as the relative productivity of the referring sources is concerned, the highest number of referrals came from medical sources with 452, of which roughly 89 per cent were ineligible. The second highest number came from educational institutions with 170 children, but approximately the same percentage of rejections were found for education, 85 per cent, as for medical sources. Parent and other lay sources referred 95 children of whom 86 per cent were ineligible. Finally, the least number of referred children were the 56 from social agencies and services, and 80 per cent were ineligible.

From the total of 773 referrals, and excluding the 14 children whose parents withdrew during screening, 86 children were eligible and admitted to the Project. Of this 86, 13 parents withdrew after admission and 13 subjects were found to be unable to maintain themselves in the group situation and were excluded. The result of all of these case finding activities was that 60 children, or approximately 8 per cent of the total number referred, actually participated in the experimental classes in the Mental Retardation Project, and 54 of them, 7 per cent, completed the program.

It should be noted that there were a total of 151 children, almost 20 per cent of the 773 gross referrals, for whom no application was made. Since no information is available for these children except the assumption by some person or persons that the child was mentally retarded, there is no way of knowing how many of them may have been eligible. The 348 referrals who were excluded prior to screening, 45 per cent of the total number referred, were so severely retarded, had such serious ancillary handicaps or were under age, over age or outside the Project service area that their ineligibility was readily recognized. For 174 children, 22.5 per cent, initial evaluation determined ineligibility. On the basis of the total information available, it would not be expected that the yield from the non-applying group would have been large.

Procedures for Referral and Admission

The procedures employed for referral and admission formed a sequential process. Although some working adjustments were made in these procedures during the early stages of the Project, they were essentially a matter of timing, of determining a more efficient sequence, or of editing a questionnaire for greater clarity. The basic essentials in the total process continued to be the same. The admission procedure was:

1. The sources of referrals gave information about the Project to parents who then made the decision as to whether or not they would apply.
2. Initial application for admission was made by parent or guardian either in person, by telephone or by letter and a written form was completed. (Assistance in completing the written application was readily available.)
3. The Project social worker received the returned questionnaire first and recommended further action on the basis of key data it contained concerning place of residence, chronological age and related obvious information associated with criteria.
4. For those children eligible for further screening, an appointment was made for the parent and the child at the Project offices, at which time the parent was interviewed by the social worker while the child was seen by the psychologist and a Revised Stanford-Binet Intelligence Test, Form L, was administered.
5. Assuming that the results of this psychological evaluation met the criteria for admission, the child was then referred for a medical examination.
6. After a review of all the collected data and a determination of apparent eligibility, the child was accepted for admission to an experimental class or for placement on a waiting list.
7. Admission to the Project was probationary, subject to a trial enrollment in a class and later evaluation of his adjustment there.

Although a consistent effort was made to screen children into the Project on the basis of established criteria for admission and diagnostic studies were supplemented by clinical judgment, it was anticipated that undetected deviations would be found later. First, the nature of functioning either intellectually or behaviorally cannot be finally determined by instruments available; second, a difficulty is presented insofar as assured confidence in the results of infantile tests is concerned; and, third, the various evaluations were made in a one to one relationship of child and examiner, while participation in a class setting demanded still a different level of adjustment. These potential problems, admittedly, were not without effect, and the leeway provided through certain elasticity in interpretations could not be expected to be a total solution.

Uncontrolled Variables Related to Subjects and Referrals

It is obvious that efforts to secure subjects for the Project were affected by a variety of influences. Related to this search for referrals as well as to the identification and selection of subjects were variables which might have been eliminated had they been anticipated, as well as others which might best be described as uncontrollable due to conditions and circumstances beyond the authority or influence of the Study. The following have been regarded as pertinent uncontrolled quantities in the Study.

Community Attitudes Toward the Disability. Despite the sophistication of the locale for the Project, there has been evidence to support the assumption that only to a limited extent has the community discovered the educable mentally retarded child at this age. As a corollary to this, the interest level in retardation, insofar as agencies are concerned, has appeared to be inadequately developed. The further fact that psychiatric clinics report the exclusion of retardates as patients may actually better reflect a community attitude than a medical judgment.

Parents' Reactions to Project Referral. Associated with the problem of community attitudes is the matter of parent reactions. While there was generally a public lethargy at the community level with regard to mentally retarded children, the reception given by parents to the Mental Retardation Project was more diverse. In the case of parents referred by medical sources, there was, on the whole, an eagerness for acceptance of the child in the Project. This was felt to be an opportunity, and some who lived out of town and were refused because of transportation difficulties suggested rather extreme measures in an effort to gain admission. Even such impractical plans as traveling 4 hours a day in order to have 2 and one-half hours in a class were offered. A relatively few parents from this group elected not to apply because they were satisfied to use a regular nursery school.

In marked contrast with the medical referrals, the parents referred by public schools showed a modicum of interest in admission. A substantial majority, 54.7 per cent, did not apply. When the child was determined to be ineligible, these parents did not protest the decision. Reactions included: (1) a denial of retardation, (2) unwillingness to remove the child from his neighborhood friends, (3) too great distance to be traveled (although not a problem in these cases), and (4) even though the child was slow, no occasion for concern was felt to exist.

Fitting into neither of the above two extreme reactions were parents referred by social agencies and services. They were generally interested in applying and appeared to regard the Project as an opportunity for the child, with the exception of foster parents, who opposed the placement on the basis that they were not convinced the children were retarded. The social agency referral parents, however, did not react as strongly to rejection as did the medical referrals.

In the fourth category, largely parent association referrals, there was a matter-of-fact acceptance of the Project based upon their awareness of the problem of retardation, their greater interest, and more extensive knowledge about it. With the exception of this latter group, the variable which remains unexplained is why the wide differences in reaction occurred and why the school referred parents were so little interested that their attitude might best be described as disinterest.

Structure of the Project. In retrospect, there are several factors related to the Project itself which may have hindered to some degree the securing of subjects. The initial form to be completed by parents was long and detailed, and, although assistance in doing this was available and proffered, it may have discouraged some from seeking admission. A second possibility was the short day, which could not provide the custodial care working parents needed. Third, there is the question as to how many more might have been available had the Project been able to provide transportation from a wider area of the City. And, as a final question, was there to some extent a resulting confusion in the situation which arose from time to time when one class had a full quota of children with a waiting list and the other was incomplete? This circumstance did exist upon occasions in regard to the older and younger groups respectively.

Conditions within the Project. Considering the subjects themselves, there were other variables which the Project found itself unable to control. Because of the freedom of choice [illegible] movement in a democratic society, parents were free to withdraw a child at any time, and this created an obstacle to maintaining a stable subject population. Another element to which previous mention has been made concerned children who apparently met every criteria for admission, but who could not adjust to the group and were removed. Not unrelated to this aspect of variability were another small group who met all admission criteria prior to acceptance, but, at the time of later evaluations showed a changing I.Q., in some cases gaining a substantial number of points and in others regressing.

In short, the whole area of case finding, referrals and the selection of subjects has proved to be a challenging one despite the extensive problems associated with it. The Project staff gained a great deal of insight in this area although it was not the primary field of study with which they were occupied. The findings related to case finding, however, have appeared to contribute to a knowledge and understanding of the identification of young educable mentally retarded children, and are thought to have sufficient value to be added to the still limited information on that subject now available.

II. THE COMPARISON PARTICIPANTS

When it became apparent early in the Study that the numbers of children available would make it extremely difficult, if not impossible, to include a home, or null, group for a control, attention was turned toward possible alternatives. One of the first proposals considered was the use of a comparison group selected from the public school classes for Children with Retarded Mental Development. Such a group would enable the Project to evaluate progress of children in the CRMD program and to compare the results with those for children who entered the same program from the experimental classes. As the first year in the Project further confirmed the case finding limitations, the plan for a CRMD comparison group was effected as an integral part of the Study. This aspect of the Project would not have been possible, nor would the follow-up of experimental class children transferring to public school programs, without extensive cooperation by public school officials, especially those in the CRMD Bureau.

Criteria for Selection

For comparison subjects, the criteria were essentially the same as for the experimental class enrollees, except that these would be older with ages roughly between seven and nine years. As might be expected, Project children entering the public school classes were rather consistently the youngest in their class. (See Table 4 in Chapter 5 for a tabulation of chronological ages of the comparison subjects and of experimental subjects at the time of transfer to CRMD classes.)

Although the public schools now were required by law to accept mentally retarded children in the same age range as the experimental class population (C.A. 5 years and above) this did not solve the difficulty in matching ages. During the first year after that mandated change in admission policy, the New York City public schools enrolled only 21 mentally retarded children under 7 years of age. To the extent that the ages of the comparison group deviated from the ages of the follow up subjects, a limitation is recognized to have existed.

Other admission criteria regarding sex, I.Q., physical status, emotional adjustment and committed family participation were held as constants for both groups. It will be noted, however, that the restriction in residence, which had been necessary for the experimental subjects, was not a factor here because no Project transportation of children was involved. The influence of this criterion difference was reduced by a practical attempt to have follow up subjects and comparison subjects in the same schools, thereby controlling to some degree the variability in school environment and classroom experiences.

Procedures for Identification of CRMD Subjects

Since all of the children on the rolls of the CRMD Bureau were mentally retarded, their total enrollment records constituted a referral list, and these rolls were opened to the Project staff for study. The procedures followed in selecting subjects were:

1. Using the roster of public schools that were in the school service areas in which current Project enrollees lived, children were listed who had: (a) C.A. of eight years six months or younger at that time, and (b) recorded I.Q. between 50 and 75.
2. Using this list of approximately 300 names, Project psychologists selected 52 names with ages as close to the follow-up subjects as possible.
3. With the permission of the public schools, parents of these 52 children were contacted and invited to participate in a study designed to determine guidelines for improving educational opportunities for young mentally retarded children.
4. When parental permission had been received for 28 of these children to participate in the Project, the same full battery of psychological, motor development, sensory-perceptual and speech and language tests and scales were administered to the CRMD candidates as were used in the evaluation of the experimental subjects.

As a final step in implementing this phase of the Project, the CRMD Bureau made arrangements for teachers of the classes concerned to complete all necessary records for both the CRMD comparison group and the Project follow up children, to rate these children on the Modified Vineland Social Maturity Scale, and to estimate their school adjustment. The Bureau further assisted in the arrangements necessary for the Project social worker to interview parents of the comparison group. In September, 1958, the new comparison subjects became an organized part of the Project study.

Family Reactions to Project Participation by Comparison Group Subjects

Based upon the reports of the social worker, the parent reactions toward placement in a CRMD class varied from an apparent understanding of the learning problems in mental retardation and acceptance of the class to what appeared to be a total lack of awareness and a reaction of confusion and rejection of the idea. Since all of the children in the comparison group were public school referrals, it is interesting to note here that, considering this group of parents as a whole, the lower interest shown by parents referred by public schools for admission to the experimental classes was reflected also in the comparison group parents. A further observation has been that parent participation was more difficult to obtain for the CRMD group, although it had been one of the conditions for selection of subjects.

In summary, both case finding and selection of subjects involved a variety of difficulties. It became increasingly evident, however, that the extent to which problems of early identification for any handicapping condition among young children are known and understood is the extent to which they can be overcome or minimized.

CHAPTER 3

SUBJECTS OF THE STUDY

I. CHARACTERISTICS OF THE PARTICIPANTS

Experimental Class Subjects

To the extent that the subjects in the study conformed to several specific criteria there was homogeneity in the total group. Differences as well as likenesses are reported in some detail in order to understand better the curriculum designed with these children and the extent of its versatility.

General Socio-Economic Background. The children who participated in the study came from a diversity of family backgrounds, representing a heterogeneous pattern in economic status, cultural and social experiences, ethnic and religious heritages. A brief description of the total group of enrollees in the experimental classes is reported in Table 2.

From the tabulated data, it can be seen that the sex distribution for the total enrollment approximated a 1:1 ratio (55 percent males, 45 percent females) and there were roughly 2 whites to 1 Negro. The religious backgrounds were rather evenly distributed, and there was an estimated 3:1 ratio of English speaking to bilingual children in the Study. Approximately 90 per cent of the children came from home environments having both mother and father figures, although the father in the family was not necessarily the natural father in each case. One child was in the sole custody of his grandmother. This group also included 4 children from foster homes with two enrolled each year for two years. Considering the family constellation as a whole, over 50 per cent of the subjects had one or two siblings, while 7 per cent were only children and a like number had as many as 5 or 6 brothers and sisters. Slightly more than one-third of the subjects were in families of three or more children.

The type of employment of the fathers ranged from highly skilled professional work to unskilled labor, although those unemployed and receiving welfare assistance were roughly one in eight and appeared high. The smallness of the sample, however, could present a distortion insofar as being an adequate reflection of the general population. In the case of the mothers, 93 per cent were housewives. Roughly 50 per cent of the family incomes were between $3000 and $6000, with only 18 per cent above this. Considering the sizes of the families involved, the 7 per cent with incomes from $1000 to $2000 would appear to be at a questionable subsistance level economically, and the 20 per cent between $2000 and $3000 at a marginal subsistance level only. These latter two categories totalling over one-fourth of the subject population have appeared to constitute a significant consideration in regard to child growth and development as these may reflect nutritional, medical and other environmental factors associated with cultural opportunities.

Educationally, 10 per cent of the fathers had less than fifth grade educations and 14 per cent had college educations. Roughly 40 per cent had some high school education. It is interesting to note that the education of the mothers closely paralleled that of the fathers at the below high school level, but was somewhat greater than that of the fathers for grades 9-12 and for college degrees.

Insofar as residence in concerned, these children seemed to come from rather stably located homes. Only 2 per cent were regarded as transient in length of residence in the neighborhood, while slightly more than 70 per cent had been domiciled in the same neighborhood community from 5 years to life. Considering the type of neighborhood, the 45 per cent living in mixed residential-commercial areas have appeared to reflect more accurately the nature of the city of New York than perhaps would be true in many communities. The 15 per cent from slums might be correlated with the proximity of such areas to the Project site or it may have had some relationship to the number of public clinics and public sources that referred subjects. In numerous aspects related to socio-economic factors, the subject group has appeared to be cross sectional in character when compared with the general population, though not in all.

General health and physical characteristics. Although mental retardation was presumed to be the primary disability, the children in the experimental group represented a varied conglomerate of concomitant physical conditions, some of which

TABLE 2

Distribution of General Characteristics of Subjects Completing Program in Mental Retardation Project

Experimental Classes, 1958 - 1961

	CHARACTERISTIC	PERCENTAGE DISTRIBUTION OF CHILDREN									
1	Race	White 67	Negro 33								
2	Sex	Male 55	Female 45								
3	Religion in home	Catholic 36	Jewish 31	Protestant 33							
4	Language in home	English 74	Bi-lingual 26								
5	Number siblings	None 7	1 or 2 55	3 or 4 24	5 or 6 7	Over 6 3.5	Not known 3.5				
6	Marital status of parents	Married 83	Sep. or div. 2.5	Widowed 2.5	Unmarried 7	Unknown 5					
7	Employment of father	Prof. or Managerial 13	Clerical or sales 20	Service 13	Skilled labor 13	Semi-skilled 13	Unskilled 16	Unemployed 2	De-ceased 2	No father 6	Not known 2
8	Employment of mother		Clerical or sales 2	Housewife 94 Charwoman 4							
9	Family income	Under $1000	1000-1999 7	2000-2999 20	3000-4999 39	5000-6999 16	7000-10,000 9	Over 10,000 6	Not kwn 3		
10	Education of father	None 2	Sp. class 2	Not known 9	Grades 1-4 6	Grades 5-8 28	Grades 9-12 13	H.S. Grad. 26	Some College 5		College degree 9
11	Education of mother	2	2	2	5	28	20	26	2		13
12	Length of family residence in neighborhood	Life (either parent) 2		Over 10 years 17		5 - 10 years 53		Under 5 years 26		Transient 2	
13	Type neighborhood	Residential 38		Mixed: Res.-Commer. 45		Slum 15					
14	Family status of child	Natural parents 90		Foster parents 8		Guardians 2					
15	Father in home	Yes natural 84 other 7		No 9							

were considered to be causative insofar as the mental deviations were concerned. The health appraisals showed the following distribution of disabilities among the subjects, including mental retardation.

Type Disability	No. Children			
	1958	1959	1960	1961
Defective vision	3	7	4	3
Defective hearing			1	1
Mental retardation	11	15	15	13
Other disabilities	14	14	7	2
Totals	28	36	27	19
Grand total	110			

The miscellaneous ancillary disabilities which were reported under the category "Other disabilities" included the following:

Ancillary Disabilities	1958	1959	1960	1961
Neurological impairments	6	4	2	2
Mongolism	1	1	3	
Cleft palate			1	
Emotional disorder	1	2		
Dorsal lordosis		1		
Other Orthopedic		2		
Aphasia		1		
Convulsive disorders	3	3	1	
Megacephaly	1			
Polydactylism	1			
Asthma	1			
Totals	14	14	7	2
Grand Total	37			

There were a total of 110 disabilities represented in the 54 experimental subjects, or an average of slightly more than 2 disabilities per child. For the 30 children represented in the tabulation of ancillary disabilities, the average number of disabilities was 2.9 per child. The average number of identified disabilities per child for each experimental class completing the program was:

Year	Average No. Disabilities per child
1958	3.8
1959	3.3
1960	2.3
1961	1.6

Because of the continuing health appraisals throughout the Project, a cumulative body of medical information was compiled and later appearing symptoms were investigated. The identity of some of these problems together with diagnoses derived were a direct result of the continuing health evaluation and not all were revealed during the initial study.

In order to understand better the nature of the child disabilities, their effects, and possible factors contributing to mental retardation, data were compiled about prenatal factors, conditions of birth, and early developmental history. To the extent that these conditions of the experimental subjects conform to expectancy or deviate from it, one may consider that the characteristics of the population are identified as a unique entity.

Pre-Natal Conditions

Conditions		Number Mothers
1. Pre-natal care began	2-3 months	42
	3-6 months	5
	6-9 months	4
	None	-
	Not known	3
2. Ordinal position of this pregnancy	First	21
	Second	18
	Third	8
	Fourth or more	7
3. Accidents during pregnancy	Falls	4
	Other	1
	None	47
	Not known	2
4. Mother's age at this birth	15-20 years	7
	21-30 years	28
	31-40 years	16
	over 40 years	2
	Not known	1
5. Illnesses of mother during pregnancy	Nausea	8
	Virus infection	3
	Convulsions	1
	Bleeding	5
	Other	4
	None	42
	Not known	2

Generally speaking, the pre-natal conditions as reported by the mothers have not appeared to be unusual with the exception that 10 of the mothers had a total of 21 illnesses during this pregnancy.

Conditions of Birth

Conditions	Prevalence of Condition Among Subjects 1958	1959	1960	1961	Totals
Prematurity (6 to 8 months)	1	5	3		9
Prolonged Labor (from 12 hours to 3 days)	3	5	1	1	10
Instrument Delivery	2	9	4	1	16
Caesarian	2	1	1	2	6
Birth Weight under 5 pounds	3	2	3	1	9
Appearance of child at birth:					
yellow skin					2
cyanotic					8
Mongoloid features					5
supernumerary digits					1
very small					9
abnormal head size					1
cleft palate					1
normal					36
not known					3

According to hospital birth records and physicians' reports, there has appeared to be a definite trend in this population toward difficult birth conditions and noticeable differences in the child at birth. Roughly one-third of the children appeared to deviate from normal appearance at the time of birth, while difficult birth conditions were characteristic of over 40 per cent of the children in the subject group.

Developmental Information

It becomes obvious in the information concerning development reported by the parents that growth was considerably slower for the experimental subject group as a whole than is normally expected for a substantial number of physical abilities. In some aspects of growth it is noted that early development for individual children was reported to be within normal range, and then later slowed to a retarded level.

Physical Development

Aspects of Physical Development	Number of Subjects and Chronological Ages at which Ability Observed					
Baby Sat Unsupported	6-8 mos. 22	9-11 mos. 17	12-14 mos. 9	15 mos. or older 2	Not known 4	
Baby Crawled	4-5 mos. 2	6-7 mos. 4	8-10 mos. 15	11 mos. or older 24	Never crawled 5	Not known 4
Baby Stood Alone	7-8 mos. 4	9-10 mos. 4	11-12 mos. 7	13-15 mos. 9	16 mos. or older 20	Not known 10

	10-13 mos.	14-16 mos.	17-19 mos.	20-26 mos.	27-32 mos.	33-36 mos.	3-4 yr.	4-5 yr.	Still does not	Not known
Walked alone	8	4	16	21	1	1				3
Spoke words clearly	4	2	5	11	7	7	4	4	5	5
Spoke short sentences	1		1	8	4	5	6	16	7	6
Followed simple directions	4	1	6	14	4	2	5	3		15
First ate with spoon	10	1	3	15	6	6	4	2	1	6
Stopped wetting-day	3		1	11	4	13	13	4	3	2
Stopped wetting-night	3			13	4	10	11	5	6	2
Stopped soiling-day	4		2	13	5	11	13	3	1	2
Stopped soiling-night	5		2	12	5	11	13	3	1	2

As a part of studying this inconsistency in growth patterns, early childhood illnesses have been considered, and a compilation of these is shown below.

Early Childhood Illnesses	No. Children
Chickenpox	12
Measles (all types)	32
Mumps	9
Scarlet fever	2
Whooping cough	1
Convulsions	3
Pneumonia	5
Fainting	2
Celiac disease	3
Hyperthermia	3
Severe headaches	4
Frequent colds	15
None	13
Unknown	1

As can be seen, despite modern child care knowledge including a variety of preventive measures available, only 13 children were reported to be free of such illnesses (plus one for whom this information was not known), or 26 per cent. In contrast, 40 children had 91 illnesses, or 2.27 each. Some of these illnesses were such that they could have been causative factors in mental retardation, although a direct relationship is not established here.

Prevalence of Mental Retardation Among Siblings. With regard to the families from which these children came, inquiry concerning identified mental retardation among the siblings showed that, with a total of 52 siblings reported, five known cases of mental retardation existed, or roughly 10 per cent. This figure does not take cognizance of the very young children who may be retarded but are not yet identified, nor of those who are older and not now in school, but whose academic achievement may have been limited, and the cause not known.

Comparison Group Subjects

General Socio-Economic Background. Considering the CRMD group as a separate population, it has some identifying characteristics which appear worthy of consideration. As can be seen in Table 3, the sex distribution is 4 female to 3 male, the racial breakdown gives a white-Negro ratio of 3:2, and the religious preferences show the highest percentage to be Catholic, and the lowest, Jewish. Also, a preponderance of these subjects come from English speaking homes.

Considering the family constellation, 75 per cent of these children are living with both a father and mother and over 75 per cent have one or more siblings. A further stabilizing factor is shown in the residence of over 55 per cent of the families in the same neighborhood for five or more years. As was seen with the experimental group, the residential-commercial character of many of the home neighborhoods reflects the community in which the study was made. A difference noted, however, was that a larger percentage of the comparison group lived in slums than was true in the experimental population.

Some indication of the economic conditions within this population can be found in the report of family incomes, with a fifth of the children coming from homes of marginal subsistence levels (under $3000 a year) and an additional 10 per cent showing public welfare as the source of income. Roughly 75 per cent of the parents reported having educations ranging from some high school to a college degree, although other data seem somewhat inconsistent with the educational levels given.

General Health and Physical Characteristics. This group, too, was studied to obtain data available concerning prenatal conditions, conditions of birth, and some early developmental history. A report of identifying data compiled from information obtained from parents follows:

Pre-Natal Condition

Conditions	Number mothers
1. Pre-natal care began	
2 - 3 months	18
3 - 6 months	5
6 - 9 months	1
None	3
Not known	1
2. Ordinal position of this pregnancy	
First	11
Second	8
Third	4
Fourth or more	5
3. Accidents during pregnancy	
Falls	1
None	27
4. Mother's age at this birth	
15 - 20 years	4
21 - 30 years	14
31 - 40 years	8
Over 40 years	2
5. Illnesses of mother during pregnancy	
Nausea	3
Virus infection	1
Convulsions	2
Diabetes	1
Bleeding	2
Other	4
None	18

TABLE 3

Distribution of General Characteristics of CRMD Comparison Subjects in Mental Retardation Project, 1958-1961

	CHARACTERISTIC	PERCENTAGE DISTRIBUTION OF CHILDREN							
1	Race	White 60	Negro 40						
2	Sex	Male 43	Female 57						
3	Religion in home	Catholic 39	Protestant 32	Jewish 25	Not known 4				
4	Language in home	English 90	Bi-lingual 10						
5	Number of siblings	None 22	1 - 2 44	3 - 4 29	5 or more 5				
6	Marital status of parents	Married 79	Separated or divorced 7	Widowed 7	Not married 7				
7	Employment of father	Professional -managerial 11	Clerical or sales 7	Service 7	Skilled labor 20	Semi-skilled 30	Unskilled 11	Unemployed 7	Not known 7
8	Employment of mother		Clerical or sales 7	Housewife 65 Other - 7		Semi-skilled 14		Unemployed 7	
9	Family income	$1000-2000	$2000-3000 20	$3000-5000 40	$5000-10,000 10		Public Welfare 10	Not known 10	
10	Education of father	1-4 years 3.5	5-8 years 17	9-12 years 69	College 7		Not known 3.5		
11	Education of mother	1-4 years 7	5-8 years 18	9-12 years 71	College 4				
12	Length of family residence in neighborhood	10 years to life 12	5-10 years 44	Less than 5 years 40	Transient 4				
13	Type neighborhood	Residential 14	Residential-Commercial 64	Slum 22					
14	Family status of child	Natural Parents 96.3	Foster home 3.7						
15	Father in home	Yes 75	No 25						

As was true with the experimental subjects, the prenatal information for the comparison subjects has not shown outstanding deviant characteristics. It is noted that 3 mothers did not have pre-natal medical care, while none were without some care in the experimental group. Ten mothers had 13 illnesses during their pregnancy, or an average of 1.3 illnesses each. In two cases, however, involving diabetes and convulsions, the conditions existed prior to the onset of pregnancy. In no instance was the duration of the pregnancy less than 7 months with a total of 8 less than full term. Comprehensive medical reports concerning the conditions of these children at birth were not available.

Developmental Information

Through parent interviews, a report was secured concerning the early development of the CRMD comparison subjects.

In physical development the retrospective subjects seemed roughly to parallel the experimental group to the extent that wide deviations from normal expectancy were prevalent. Although medical data are insufficient for this group to show any correlation between early childhood illnesses and the problem of mental retardation, there is strong evidence in this group, too, that for individual children, the early development reported has appeared to be within the normal range.

Prevalence of Mental Retardation Among Siblings. In the comparison group, it was found that there were a total of 21 known siblings, and, of this number, 5 were identified as being mentally retarded, or approximately 24 per cent, which is exceedingly high.

Although characteristics vary as do the sizes of the two populations, namely, experimental and comparison, there are a number of similarities to be found among the characteristics noted in the two groups. Even when one considers that the comparison group's smaller numbers, of necessity, give a greater weight to each in a percentage distribution, the actual numbers of children in both groups are such that they constitute small samples, and, therefore, both are affected by this weighting effect.

Physical Development

Aspects of Physical Development	Number of CRMD Subjects and Chronological Ages at which Ability Observed									
Baby Sat Unsupported	6-8 mos. 13	9-11 mos. 5	12-14 mos. 4	15 mos. or older	Not known 6					
Baby Crawled	7-8 mos. 2	9-10 mos. 6	11-12 mos. 7	13-15 mos. 2	16 mos. or older 6	Not known 5				
Baby Stood Alone	4-5 mos.	6-7 mos. 3	8-10 mos. 5	11 mos. or older 8	Never crawled 4	Not known 8				
	10-13 mos.	14-16 mos.	17-19 mos.	20-26 mos.	27-32 mcs.	33-36 mos.	.3-4 yr.	4-5 yr.	Still does not	Not known
Walked alone	6	7	5	6	3					1
Spoke words clearly	1		7	5	2	3	3			7
Spoke short sentences					5		10	6	1	6
Followed simple directions	3		1	3		2	2	3		14
First ate with spoon	8		3	2	1	1	2	3		8
Stopped wetting-day	2		6	4	2	2	4	4		4
Stopped wetting-night	3		3	7	3	1	3	3	1	4
Stopped soiling-day	3		7	7	2	1	2	3		3
Stopped soiling-night	2		5	7	3	2	2	2		5

II. CASE STUDIES OF EXPERIMENTAL SUBJECTS:

Summary Reports on a Random Selection of 21 Case Records

In order that the sample case studies reported here may be as succinct as possible without sacrificing the more important aspects of the individual records, a consistent pattern of reporting has been followed. The age given first is that at time of admission to a Project class; terminal age is that at time of leaving the class; and final age, that at which follow-up ended. The number of days is the number in actual class attendance. Abbreviations used are: S-B, Revised Stanford-Binet Intelligence Test, Form L; M-P, Merrill Palmer Scale; D.C.S., Mental Retardation Project Developmental Curriculum Scale; V.A., Vocabulary Age; L.A., Language Age; and W-R, Wide Range Achievement Tests.

These case records represent a cross section of the experimental subject population, including: male and female, white and Negro, English speaking and bi-lingual, all three major religions, lower and higher socio-economic backgrounds. They also represent each of the four years of study, those who progressed substantially and some who did not. The case numbers shown for this sample of 21 children from the total subject population of 54 are those consistently employed throughout the report for the same children.

Child 3: Female, age 5-10, white, Jewish, English speaking, 125 days, terminal age 6-6, final 9-1.

Socio-Economic Status. An only child living with natural parents in an attractive garden apartment in a residential neighborhood. Books, toys and other stimulations available. Father in a professional occupation with income roughly $7000; mother a housewife. Both parents college graduates. Parents eagerly sought admission to a Project class as highly desirable and needed.

Medical Condition. A stocky mongoloid child showing a great deal of anxiety, grinding teeth until they are worn to gums, subject to psychogenic vomiting. Has better muscle coordination than is usual for a mongoloid. Does not relate well to children. This pregnancy complicated by heavy bleeding during third, fourth and fifth months. Birth was approximately 6 weeks premature after a difficult labor and instrument delivery. Necessary to resuscitate infant. Diagnosis: mongolism, hypothyroidism, allergies and asthma.

Psychological findings. Entrance S-B 55 I.Q.; final 56 I.Q. Initial test showed marginal educable range with a multiplicity of disabilities and a great deal of anxiety. Later test results clearly in the low educable range, but without marked gains.

Speech and Language. At time of admission, good language usage and speech clearly intelligible. Some substitutions noted. Voice quality harsh with some nasality; spontaneity in speech limited. During participation in the Project, no dramatic improvement noted, yet V.A. increased from 3-2 to 6-6. In contrast, verbal language increased very slightly.

Extent of Growth and development. Initially negativistic toward other children, refused to share materials or to enter into activities without encouragement. Fearful of stairs, slides, swings and even the toilet. Resisted working with materials that could soil, such as, clay, paint. Prior to the end of the term these fears were dispelled and she participated in group activities. Continued to show little interest or progress in motor and creative skills, such as cutting, pasting, coloring. Previous defense against experiences was vomiting, but, as security increased, this disappeared. Follow-up in CRMD class; W-R achievement: spelling 1.5, oral arithmetic 1.0, reading 1.8.

Child 4: Male, age 5-11, white, Catholic, English speaking, 89 days, terminal age 6-6, final 9-5.

Socio-economic status. A child of unwed parents, father unknown and mother in an institution for the mentally retarded. Lived with middle-aged foster parents under the custody of a public agency. Foster home privately owned and well maintained. The foster father in a skilled trade, foster mother a housewife with another foster child resident in home. Income of father approximately $6,000. These parents had elementary education. Home placement a stable one; subject accepted and liked; agency reports showed previous homes had not been equally adequate. Project placement accepted by foster parents, but not regarded as necessary.

Medical condition. Child reported to have been premature; actual knowledge about early life meager. He is slender, quiet, generally cooperative and cheerful. General health good and appeared well nourished. Had agility in both gross and fine motor coordination. Showed need for affection; was easily frustrated resulting in infantile regressions. Diagnosis: familial retardation.

Psychological Findings. Entrance S-B 66 I.Q.; terminal S-B 70 I.Q.; final 71 I.Q. Initial intellectual functioning at educable level which scores maintained. Visual memory consistently low. Because of instability resulting from frequent home changes and adjustments, there is a possibility that he has greater potential strengths.

Speech and Language. Speech rated initially as partially intelligible, with infantile articulation; speech limited to words and phrases. Later showed steady improvement in vocabulary comprehension, general language abilities and articulation. At termination, speech and language abilities had increased steadily and speech completely intelligible. Final V.A., 5-8; L.A., 6-5. Articulation, vocal variety and sentence length greatly improved.

Extent of Growth and Development. Entered late; demanded a great deal of attention, using tantrums to protest any denial. In self-help he was self-sufficient. Showed good motor coordination, learned new skills easily. Improved rapidly in large muscle activity; showed good conceptualization in learning names, using colors, generalizing, and numbers. Significant progress made in socialization; tantrums ended. At time of exit was at reading readiness level. Showed interest and talent in music. Follow-up in Regular 3rd grade; W.R. achievements: spelling 1.6, oral arithmetic 1.2, reading 1.9.

Child 6: Female, age 6-6, white, Catholic, English speaking, 106 days, terminal age 7-2; final age 9-8.

Socio-Economic status. Older of two children living with natural parents in an apartment in fair condition in a residential-commercial area. Father a truck operator; mother a housewife. Family income slightly in excess of $3100 a year. Both parents completed elementary school; seemed to value education. Parents recognized child was retarded and wanted the special placement, although mother regarded it as more urgent than did the father.

Medical Condition. Quiet, shy child, tall and well-developed. Extremely tense. Poor attention span and hyperactive. Birth normal, but respiration delayed. Mother hospitalized for hemorrhages during third month of pregnancy. History of early convulsive seizures; great deal of conversation with imaginary people. Diagnosis: Mental retardation caused by congenital cerebral anoxia; abnormal E.E.G. with deviations of type seen with convulsive disorders; tachycardia; minimal spastic quadriplegia; visual imbalance; emotional disturbance.

Psychological findings. Entrance S-B 50 I.Q.; terminal S-B 52 I.Q.; final 44 I.Q. Initial marginal educable level of functioning was maintained in Project class. During follow-up measurable I.Q. showed a drop to below educable level. Extent to which this may reflect withdrawal from a difficult situation is not known.

Speech and Language. Initial evaluation showed good language with a high degree of intelligibility and only minor substitutions. Spontaneous speech limited. During Project participation, little change in language level, but vocabulary age during follow-up increased from 3-5 to 5-8.

Extent of growth and development. The first girl to enter older class; did not relate to others nor join readily into activities. Easily distracted and attention span short. Often watched or stared into space. Later showed a perceptual ability to do puzzles, play Lotto, and to color. Progress in social skills hindered by difficulty in relating to children. Progress mainly in learning classroom routine, following instructions, and in self care in dressing, washing, toileting. Follow-up in CRMD class; W-R achievement: spelling 0.0, oral arithmetic 0.4, reading 0.0.

Child 8: Male; age 6-7, Negro, Protestant, English speaking, 110 days, terminal age 7-2, final 9-9.

Socio-economic status. Second of four children living with mother on the 5th floor of walk-up slum apartment in a deteriorated neighborhood. In the apartment, there was evidence of considerable effort to make it attractive, although not well maintained. Mother a housewife; welfare support under $2,000 a year. Education of both parents terminated in lower elementary grades. Mother accepted the placement as needed, but not urgent.

Medical Condition. A well-developed, well nourished sturdy child, quiet, speaking little. Manual coordination relatively good. Birth was normal. At 9 months of age critically ill with pneumonia and very high fever for 2 days. Diagnosis: Retardation resulting from brain damage caused by hyperthermia.

Psychological findings. Entrance S-B 61 I.Q.; terminal S-B 75 I.Q.; Final 74 I.Q. Initially functioning intellectually in the educable range, improved to the borderline level. Extreme fluctuation occurred in tests of visual psychomotor ability. Follow-up showed evidence of problems.

Speech and Language. Speech intelligible throughout the study, but the quality improved. Language abilities and articulation showed steady gradual improvement. Final V.A., 7-6. At end of follow-up, L.A. dropped.

Extent of Growth and Development. Active, enjoyed school, initiated relationships and liked large muscle play, such as riding bicycles, racing, climbing. Showed little creativity, but liked coloring, cutting, clay and drawing. Highly imaginative, but fantasies diminished as his activities and interests increased. Creativity improved as did self-care skills. Developed a sense of rhythm and learned to march, dance and sing. Leadership qualities developed. At time of exit had attained readiness skills. He began to initiate sharing, which he had resisted. Follow-up in regular 4th grade: W.R. achievement: spelling 1.9, oral arithmetic 1.6, reading 1.8.

Child 9: Male, age 5-11, Negro, Protestant, English speaking, 108 days, terminal age 6-7, final age 9-2.

Socio-economic status. Second of 5 children living with natural parents in a well-maintained public housing project. Furnishings poor, but apartment kept attractively and children held to good standards. The formal education of the parents was limited. Father was a short order cook, the mother a housewife. The family income was approximately $3100. The special class considered an opportunity and accepted by both parents.

Medical Condition. A sturdy, well-developed child with good general health. Quiet, obedient, cooperative. Birth normal and without complications. Diagnosis: Retardation of familial type.

Psychological Findings. Entrance S-B 52 I.Q.; terminal S-B 60 I.Q.; final 71 I.Q. During Project attendance, intellectual functioning increased from doubtful educable range to educable on the Stanford-Binet and to high educable and borderline on two other intelligence tests. Seemed to benefit from stimulation, and his potential appears nearer low average than educable retarded.

Speech and Language. Initially speech infantile and only partially intelligible. Improved to complete intelligibility; substitutions and omissions disappeared, and longer sentences were used. In addition, animation and spontaneity increased. V.A. improved from 3-6 to 5-6; L.A. from 3.0 to 3.5.

Extent of Growth and Development. Entered into group play and classroom activities from the beginning. Soon became interested in readiness activities and later rapidly developed number concepts and began to read and write. Progress in manipulation skills sporadic, at times distracted easily by other children nearby. Avoided climbing and swinging, but used large muscles efficiently in riding moving vehicles. Creativity above the group in work with clay, paint and crayon. Social relationships good, including willingness to share. At follow-up was in CRMD class. Not available for Wide-Range tests.

Child 12: Male, age 5-11, Puerto Rican, Catholic, bilingual, 121 days, terminal age 6-11, final 7-7.

Socio-economic status. Next to the youngest of nine children, one married and away. Lived with natural parents in a slum apartment under extremely poor conditions. Despite unfavorable conditions, there was evidence of attempts to make it livable. Father a seaman, mother a housewife. The family income less than $3,000. Neither parent went beyond the 4th grade. Both parents accepted placement in the class and appeared to accept the retardation. Two other children in special classes and one had been involved in delinquent acts, contributing to tensions of the mother particularly.

Medical Condition. The 9 children showed a history of 6 with convulsive disorders, 3 retarded, 4 asthmatic. Mother had uncontrolled epilepsy, diabetes and asthma. Child's general health good; under medication for epilepsy. Speech not clear a and behavior that of a 4 or 4-1/2 yr. old child. Birth reported to be a month premature; birth weight over 10 pounds. Diagnosis: familial retardation and epilepsy.

Psychological Findings. Entrance S-B 66 I.Q.; terminal S-B 72 I.Q.; final 64 I.Q. At admission, functioned intellectually at the high educable level. At end of class participation, held this level on S-B, but on other tests attained borderline level. A great deal of inter-test variability; in tests not stressing verbal skills and more culture free, there was a consistency in the upward trend.

Speech and Language. Initially speech babyish and rated partially intelligible with voice high and thin. Prior to termination, vocabulary comprehension, sound discrimination and general language abilities improved. Voice had become lower and stronger. Little measurable gain in V.A. and L.A.

Extent of Growth and Development. Entered with ability in self-care; followed routines and directions easily. In conceptualization, imagination, dexterity and poise superior to the other children. Needs were to learn socially acceptable classroom behavior, to develop readiness skills, to maintain interest in completing a task, to curb excitability. Made progress in all areas although the need to live differently in two cultures - home and school - was difficult. Slight measurable progress made. Follow-up in institution.

Child 16: Female, age 5-10, white, Jewish, English speaking, 147 days, terminal age 7-0, final 8-8.

Socio-economic status. Older of two children living with natural parents in attractive garden type apartment in good residential section of City. Books, records, suitable play materials generously in evidence. Father in a skilled profession, mother also college educated. Family income exceeds $10,000 a year. Both parents sought child's placement in program and appeared to understand and accept child's problem.

Medical Condition. Pleasant, happy mongoloid child in good health. Birth 4 weeks premature and uncomplicated. Diagnosis: mongolism and retardation.

Psychological Findings. Entrance S-B 56 I.Q.; terminal S-B 57 I.Q.; final 58 I.Q. Throughout participation in Project intellectual functioning remained in the educable range, with occasional isolated tests dropping to doubtful educable. Appeared to have stability in intellectual functioning and a slow but steady increase in mental age.

Speech and Language. Initially, speech was rated as partially intelligible, language limited to words and phrases, and voice denasal and breathy. During her participation, vocabulary comprehension, sound discrimination and general language abilities showed gradual improvement as did articulation of speech sounds. Use of verbs and of complete sentences increased substantially. V.A. moved from 3-2 to 6-6; L.A. from 3.8 to 4.6

Extent of Growth and Development. Entered into activities and related well with teachers and individual children. Adequately self-sufficient in self-care although not neat in eating. Fairly long attention span, remembered easily, could take her turn patiently. Showed adequate gross motor skills. Although in group a short time, showed notable progress in all skills and areas of interest. Relationships gained in warmth. Follow up in CRMD class. W.R. achievement: spelling 1.9, oral arithmetic 1.5, reading 2.6.

Child 19: Female, age 5-2, Negro, Catholic, English speaking, 204 days, terminal age 6-9, final 8-6.

Socio-economic status. Second of four children living with natural parents in well-maintained public housing project. Apartment furnished with minimum essentials, but carefully kept. Father a busboy with income under $3,000; the mother a housewife. Both parents have elementary education. Intellectual stimulation lacking in the home, but many social contacts with a large family of aunts and uncles. There seemed to be a lack of stability with the parents of the child separating periodically. Placement in Project accepted, although father did not accept that child was retarded. The mother did accept it.

Medical Condition. The surviving twin with birth two months premature. Slender, placid child, cooperative and quiet with good general health. Musculature poorly developed, lumbar lordosis, large head suggesting arrested hycrocephaly. Speech audible but content poor. Diagnosis: spastic quadriplegia with moderate involvement of feet and minimal in hands; retardation resulting from physical conditions.

Psychological Findings. Entrance S-B 50 I.Q.; terminal S-B 55 I.Q.; final 55 I.Q. Initially, intellectual functioning at marginal educable level, improving to clearly educable functioning. Results on tests requiring psychomotor ability shows significant improvement. Variability shown appeared the result of reaction to environment rather than inherent quality in functioning. Consistent lack of energy considered a factor in level of functioning.

Speech and Language. Early tests gave rating of complete unintelligibility. Speech and language remained at low level of development, but vocabulary comprehension, sound discrimination and general language ability improved. To a lesser degree, articulation improved. V.A. improved from below 2-6 to 4-3; L.A. from 2.4 to 3.6.

Extent of Growth and Development. Coordination was poor, but child tried all new equipment and activities. Showed good memory and long attention span. Gradually became less shy, somewhat more aggressive, spoke in stronger voice and spoke more. Relationships improved. Developed more gross and fine muscle skills. self-care progressed. Accepted responsibility; showed greater independence. Beginning to show interest in readiness materials. Follow-up in class for double handicaps. Not available for achievement tests.

Child 23: Male, age 5-1, white, Jewish, English speaking, 283 days, terminal age 6-9, final age 8-5.

Socio-economic status. Older of two children living with natural parents in slum area in well-maintained apartment. Father a truck driver, mother a housewife. Family income in excess of $4,000. Father completed 8th grade and mother the 9th. Parents regarded child as slow but not retarded; accepted Project placement as an aid for social experience and speech improvement, although it was not regarded as critical need.

Medical Condition. Well-developed, well-nourished child, varied from quiet, shy and cooperative to excitable. Had a short attention span, awkward gait, strabismus. Birth at full term with instrument delivery after long, difficult labor. Mother has mitral stenosis. Diagnosis: In addition to visual problem, mental retardation resulting from suspected neurological impairment.

Psychological Findings. Entrance S-B 57 I.Q.; terminal S-B 68 I.Q.; final 57 I.Q. Initial testing resulted in wide scatter of test items, no doubt affected by high degree of distractibility. Scored in low educable range. By end of class participation, measurable I.Q. was at a mid-educable level; distractibility had lessened considerably. Latter could have resulted from medication. During follow-up, regressed to earlier level.

Speech and Language. At admission, comprehension of speech and articulation good with some substitutions and omissions. Intelligibility decreased markedly during periods of acute hyperactivity. Language well-developed; spoke in sentences and with sequential ideas. Little change in language level during Project class participation, although child-child communication increased.

Extent of Growth and Development. Hyperactive, distractable, had tantrums when frustrated. Pleasant social relationships with teachers, limited with children. Inquisitive and willing to try any material or equipment, but shunned responsibility. Enjoyed music. Even under medication, hyperactivity increased. After acquiring glasses, sense of relatedness increased. Developed ability to do readiness work and to contribute in activities including dramatic play. Still shows excessive excitability. Follow up in CRMD class. W-R achievement: spelling 1.0, oral arithmetic 0.7, reading 1.2.

Child 25: Female, age 5-0, white, Catholic, English speaking, 264 days, terminal age 6-7, final 8-2.

Socio-Economic status. Second of three children living with natural parents in apartment in attractive residential neighborhood. Both building and apartment well-maintained; home cheerful and well kept. Toys much in evidence, and social contacts with adults and children frequent. Father in a sales and service occupation earning $5300.00 a year, mother a housewife. Both had high school educations. Parents welcomed placement as opportunity for social growth and speech improvement.

Medical Condition. Charming, rosy-cheeked, slender child, reasonably well-developed. Shy and cooperative. Although she did not speak, she did communicate. Very small for age. A visual handicap - strabismus. Diagnosis: suspected brain injury due to anoxia during labor; mild spastic quadriplegia; tachycardia and dwarf stature.

Psychological Findings. Entrance S-B 48 I.Q.; terminal S-B 46, final 61 I.Q. Initially functioning at doubtful educable level, recognizing effect of physical handicaps. At end of participation, intellectual functioning still at doubtful educable level on S-B, but on a test designed for children with verbal and motor distrubances, was in educable range. During later follow-up, level of functioning continued to rise.

Speech and Language. Although without intelligible speech at time of admission, improvement was steady. During participation, Mecham L.A. increased from 1.44 to 4.62. Began to speak in phrases and with some spontaneity. Symptoms indicated childhood aphasia, responded to therapy.

Extent of Growth and Development. Interested in all school activities and popular with children though she did not speak and was shy. Soon showed willingness to try anything new. Memory good, as was attention span for things of interest. Gradually developed increased number of skills, greater independence in self-care and helped others. Acquired a small vocabulary; took more responsibility. Developed abilities in creative media. Trying hard to speak. Follow-up placement in aphasic class. W-R achievement: spelling 2.2, oral arithmetic 1.2, reading 2.0.

Child 26: Male, age 5-11, white, Catholic, English speaking, 122 days, terminal age 6-11, final age 7-9.

Socio-economic status. Oldest of three children living with natural parents in residential apartment in good condition and well-maintained. Father in a skilled service occupation income approximately $5,000.00; mother a housewife. Both parents high school graduates. Father more accepting of placement than the mother, which was consistent also with his greater acceptance of the condition of retardation.

Medical Condition. Initial reaction shy and apprehensive, but soon at ease, friendly and cooperative. Birth 2 months premature; instrument delivery after long labor. Left eye perceives light only and field of vision of right eye is restricted, cause retrolental fibroplasia. Speech clear. Diagnosis: retardation resulting from brain injury.

Psychological Findings. Entrance S-B 72 I.Q.; terminal S-B 74 I.Q.; final 71 I.Q. At admission, scored in the upper range of educable mentally retarded. Question raised concerning the effect visual defect might have on test performance. Final tests showed no appreciable change.

Speech and Language. Diagnostic language evaluation showed oral language well developed and conversational speech and language adequate. Articulation good. During enrollment V.L. age increased from 3.8 to 4.3 years; at follow-up had reached 7.0 years. V.A. age fluctuated, but showed an overall change from 4-6 to 5.8 years.

Extent of Growth and Development. Growth in all areas began in first year and continued during second. At first a disruptive force, began to exercise legitimate leadership, developing good relationships with teachers and pupils. Enthusiastic in all activities, cooperation increased as did his progress in academic readiness. Developed number concepts and good language. Ability to control and direct energy and to respect and be respected were outstanding. Substantial progress made. Follow-up placement 2nd grade. W-R achievement: spelling 2.7, oral arithmetic 1.6, reading 3.2.

Child 30: Male, age 5-6, white, Jewish, bilingual home, 264 days, terminal age 7-3, final age 8-1.

Socio-economic status. Younger of two children living with natural parents in public housing project; home adequately furnished and well maintained. Father in a skilled service occupation; mother a housewife. Income is under $5,000. Parents are foreign-born, have approximately an 8th grade education, and a well defined regard for learning. Older son is an outstanding student. Special placement acceptable to both parents as an opportunity; expectations for this son minimal. Family a close knit one, mutually supportive.

Medical Condition. Quiet, shy mongoloid child with some understandable speech and behavior of a child under 3 years. General health good; attentive and not distractable. Birth reported to be normal after relatively short labor. Diagnosis: retardation and mongolism.

Psychological Findings. Entrance S-B 51 I.Q.; terminal S-B 39 I.Q.; final 45 I.Q. Initially tested questionable educable level. During enrollment fluctuated between trainable and low educable levels. Tests involving psychomotor abilities stable in the doubtful educable range.

Speech and Language. From a very immature functioning, progressed in social and communication areas, in self-help, manipulation, and large motor activities. Accepted a new responsibility in the social group and cooperated in play and work. After a period of regression, again became a participant and more self-reliant. Slowly speech and language showed some improvement; became interested in readiness materials. Progress was variable, but some positive gains. Follow up placement: private special class. W-R achievement: spelling 0.0, oral arithmetic 0.7, reading 1.2.

Child 32: Male, age 5-0, Negro, Protestant, English speaking, 204 days, terminal age 6-9, final age 7-7.

Socio-economic status. Older of two children living with natural parents in a Public Housing Project in good condition. Father is a government employee with income approximately $5,000; mother a housewife. Both have some high school education. Parents considered the class desirable, accepted the child as retarded.

Medical Condition. Easy, timid manner. Attentive, but great difficulty in following simple verbal instructions. Speech not clear. Unusual head shape and size. Did not dress nor feed self. Birth reported to be normal. Diagnosis: possible brain acephaly, mental acephaly, hydrocephaly.

Psychological Findings. Entrance S-B 58 I.Q.; Terminal S-B 92 I.Q.; Final S-B 79 I.Q. At admission, in lower range of educable, recognizing possible effect of language difficulties. Later tests substantiated original results, despite mounting distractibility. Toward end of Project class participation, I.Q. rose, reaching low normal level. Marked improvement during follow-up until final tests, which dropped to low dull normal or upper educable.

Speech and Language. Speech unintelligible; used only words and phrases. Many sound substitutions, speech slurred. Difficulty understanding oral cues. No consistent progress, but overall improvement during program. L.A. increased from 2.0 to 5.8 and during follow-up to 6.6.

Extent of growth and development. Although extremely limited initially, made gains in all areas. In conversation, reporting, a developed time sense, spontaneous reading activities and social growth, greater confidence replaced an earlier timidity. Self care increased. Substituted solitary play with group activity, i.e., use of moving vehicles, running games, dramatic play. Vocabulary and dexterity increased. Speech developed rapidly, articulation improved. Grew in self-assurance, showed ability to learn quickly. Follow-up placement; regular 2nd grade. Wide Range achievement: spelling 3.8, oral arithmetic 2.0, reading 4.5.

Child 33: Female, age 5-1, white, Catholic, English speaking, 206 days, terminal age 6-7, final age 7-5.

Socio-economic status. Older of two children living with natural parents in apartment in older section; home in good repair, well-furnished and maintained. Father's occupation a skilled trade; mother a housewife. Income approximately $5,000. Both parents completed high school. Mother accepted special placement and anticipated high school and college for the child. Tensions in home concerning child were observable.

Medical Condition. Shy child; good general health, intelligible speech and fair comprehension of language. History of convulsive disorders in the family; child's fainting and other behavior symptoms suggestive of possible neurological impairment, not confirmed. Showed fears and the resistance of a child between 2-1/2 and 3 years. Birth reported to be normal after uncomplicated labor. Estimated to be slightly premature although birth weight over 5 pounds. Diagnosis: Retardation, etiology not known.

Psychological Findings. Entrance S-B 58 I.Q.; terminal S-B 90 I.Q.; Final S-B 88 I.Q. Initial functioning in educable range, but an early upward trend noted. By termination, functioning in low average range, although with a pattern of variability. Psychomotor development improved significantly. Strong indication that potential had not been reached.

Speech and Language. Initially, showed an infantile language pattern and spoke in single words and phrases. Speech rated partially intelligible. Later evaluations showed considerable improvement and use of sentences. Vocabulary comprehension, sound discrimination and general language abilities improved. V.A. increased from below 2.6 to 5.0 and L.A. from 3.8 to 7.25.

Extent of Growth and Development. Greatest gain in social competence, resourcefulness and individuality. Handwork skills, trips, and music all contributed to development of interests; showed readiness for pre-reading activities and beginning writing. Progress considered marked. Follow-up placement regular 2nd grade. W.R. achievement: spelling 2.8; oral arithmetic 1.8; reading 4.0.

Child 35: Female; age 5-8; Negro; Protestant, English speaking, 136 days, terminal age 6-11; final age 7-7.

Socio-economic status. Second of two illegitimate children living with natural mother and stepfather and three half-sisters in well-maintained public housing project. Apartment sparsely furnished, but very clean; family appeared close knit and happy. Cultural evidences few, but group activities, such as picnics and shopping, frequent. The father in unskilled occupation with income under $3,000 a year. Father attended vocational high school; mother, elementary school. Father had high standards for all 5 of children. Special placement accepted willingly for child after initial rejection of idea.

Medical Condition. Quiet, shy child, reserved in manner, small, and graceful. Large muscle coordination excellent. Followed directions at the level of a 4 or 4-1/2 yr. old. Spoke clearly in sentences. Hearing in right ear defective. Frail appearing but general health good. Birth reported to be normal at full term. Birth weight under 5 pounds. Suffered a head injury in an automobile accident with residual intense headaches. Diagnosis: mental retardation with etiology unknown. Possibility of brain injury resulting from accident.

Psychological Findings. Entrance S-B 73 I.Q.; terminal S-B 80 I.Q.; final 81 I.Q. At entrance, functioned intellectually in high educable range, reaching borderline level prior to termination. Psychomotor improvement paralleled intellectual growth. Some evidence that underprivileged environment, including inadequate nourishment, might have influenced earlier functioning.

Speech and Language. Articulation good, but speech initially rated partially unintelligible because of weak voice becoming a whisper. Progress fluctuated but overall gains good. V.A. improved from 3-3 to 8.1 at end of follow-up.

Extent of Growth and Development. Exhibited some competence in pre-school curriculum areas and in social relations in beginning, and steady noticeable progress made. Liked all activities and exercised leadership role in group. Showed greater than average sensitivity to others. At time of exit appeared ready for more academic program. Follow-up placement regular 2nd grade. W.R. achievement: spelling 1.7, oral arithmetic 1.4, reading 1.8.

Child 39: Female, age 6-1, white, Protestant, English speaking, 146 days, terminal age 7-2, final age 7-11.

Socio-economic status. Older of two children living with natural parents in apartment in a residential section. Building in good condition and apartment attractive. Toys, play equipment, books in evidence. Father in managerial service work; mother a housewife. Income exceeds $7,000. Both parents had some college education. Child included in family social activities and had frequent contacts with both children and adults. Parents welcomed the special placement as an opportunity, although not an urgent need.

Medical Condition. Friendly, pleasant child apparently in good health. Had difficulty following simple directions and behavior that of a 3 year old. Little information concerning birth except that it was an instrument delivery. Neurological reports within normal limits. Diagnosis: Retardation of familial type. Etiology not known.

Psychological Findings. Entrance S-B 60 I.Q.; terminal S-B 58 I.Q.; Final 58 I.Q. At entrance, 3 different tests of intelligence showed functioning at educable level. At end of Project class one test heavily weighted in verbal area showed approximately the same and one primarily of performance showed high educable. Psychomotor abilities, color identity and color sorting did not improve. Right sided dominance acquired.

Speech and Language. Initially speech rated as infantile, regressing later to unintelligible. Then, showed gradual improvement. Speech became more fluent and vocal variety increased. Still spoke in phrases, but beginning use of sentences observed. Intelligibility, vocabulary comprehension and general language ability increased.

Extent of Growth and Development. Interest in exploring hand work media led to fuller group participation. Language problem presented obstacle, especially in comprehension. Cooperative, energetic and persevering. Indications of visual problem, not medically confirmed. Follow-up placement: CRMD class. W.R. achievement: spelling 0.8, oral arithmetic 0.7, reading 0.5.

Child 40: Male, age 5-3, white, Catholic, English speaking, [illegible] days; terminal age [illegible]; final age 7-11.

Socio-economic status. Second of three children living with natural parents in apartment located in mixed residential-commercial neighborhood. Father in professional work; mother a housewife. Family income was not less than $6,000 a year. Father had a college education and mother completed high school. Family appeared close knit with good standards, and this child an accepted member of the group. Project placement accepted by parents.

Medical Condition. Child fearful and cried easily. Behavior that of a 3 year old. General health good as was gross coordination, but clumsy in fine movements. Birth at full term after relatively short labor. Instrument delivery. Diagnosis: Retardation, cause not known.

Psychological Findings. Entrance S-B 60 I.Q.; terminal S-B 70 I.Q.; Final S-B 60 I.Q. Difficulty in understanding child at time of initial testing suggests possibility of higher functioning than reported I.Q. Later testing substantiated the suspicion in a 10 point gain. However, during subsequent follow-up, increase not maintained.

Speech and Language. Initial articulation good with few omissions and substitutions. Oral language well developed; vocabulary adequate; ideas well related to situation. Spoke in sentences. Speech continued at approximately same level, with slight improvement near the end of class. During follow-up, gain was held. V.A. improved from 4.8 to 5.6.

Extent of Growth and Development. Earlier timidity began to disappear followed by rapid progress in all developmental areas. Competency in manipulation skills increased as did social relationships. Worked well in group projects, consistently moving toward greater self-reliance. Increased self-help skills were directed toward helping others. Interested in most readiness materials. Language good. Fears of swimming diminished, but not overcome. Follow-up placement in special class. Wide Range achievement: spelling 0.0, oral arithmetic 0.6, reading 1.2.

Child 42: Female, age 5-11, white, Protestant, bi-lingual, 273 days; termination age 7-6.

Socio-economic status. Younger of two children living with natural parents in low cost public housing project. Father in service job with Merchant Marines; mother a housewife. Family income under $4,000, but not as minimal as the living standards. Neither parent had higher than eighth grade education. Older sibling attended CRMD class. Home indicated both cultural and physical deprivation with a modicum of furniture, poorly maintained and lacking any sign of books, magazines, radio, television, newspapers, and also, toys, games or other play materials. Mother ambivalent to special placement. Both parents believed child slow, but not retarded, and capable of later normal achievement in high school or college.

Medical Condition. This child in good health. Speech voluble but not easily understandable. Responded to directions at the 4 year age level. Birth was by Caesarean section after six hours of labor, but no medical evidence of physical damage. History of maternal syphilis, but child's tests negative. Diagnosis: familial retardation; no identifiable medical cause.

Psychological Findings. Entrance S-B 60 I.Q.; terminal S-B 71 I.Q. During Project participation, child moved from high educable to borderline to low average in measures of intelligence in which performance items outweighed verbal ones. Inability to communicate verbally with greater ease may have caused some variability in test performance.

Speech and Language. At admission, speech rated unintelligible. Voice strong and clear. Speech did not approach adequacy during attendance and test scores all fluctuated. There was an upward trend. Reticence in speaking increased. V.A. increased from below 2-6 to 4-8.

Extent of Growth and Development. Shyness continued, but worked well in most areas, such as group counting, naming colors, but not independently. Enjoyed art expression; participated and interacted congenially in group. Related more easily to children than to adults. Good coordination and control of fine muscles. Competent in self care and aided others. Generally speaking, there was steady progress in all areas. Follow-up placement: CRMD class. W.R. achievement: spelling 0.7, oral arithmetic 0.3, reading 0.7.

Child 44: Female, age 5-5, Negro, Protestant, English speaking, 284 days, terminal age 7-2.

Socio-economic status. Oldest of three children living with natural parents in well-maintained housing project. Father employed in semi-skilled work with income approximately $3,000 a year; mother a housewife. Both parents had some high school education. Special placement accepted, but not considered an urgent need.

Medical Condition. Quiet, docile child of slender build. Spoke little and words not clear. Behavior similar to that of a three-year old child. Had an aversion to light and kept eyes half-closed. No birth record available.

Psychological Findings. Entrance S-B 51 I.Q.; terminal S-B 67 I.Q. Functioned initially on tests in the low educable range, and general impression of performance consistent with test scores. At end of program, however, she showed a gain of 16 points, more consistent with results shown on M-P.

Speech and Language. Subject spoke in sentences at time of admission; articulation only fair with many substitutions and omissions that interfered with intelligibility. During participation, no dramatic improvement was noted, but there were steady gains. Verbal language improvement reflected in L.A. change from 2.0 to 3.0; V.A. from below 2-6 to 3-3.

Extent of Growth and Development. Progressed to pre-readiness interests, trying to reproduce printed letters. Shows pleasure in all art media and especially in dancing. Related well to other children and teachers, and showed increasing self-direction and self-reliance. Good coordination of fine muscles and increased motor skills. Although slow in achieving self care activities, these were mastered. Despite visual disability, progress was marked. Follow-up placement: Low I.Q. class. W.R. achievement: spelling 0.0, and arithmetic 0.9, reading 0.5.

Child 48: Female, age 5-0, white, Catholic, English speaking, 224 days, terminal age 7-5.

Socio-economic status. Third child living with natural parents in owned home in excellent condition located in desirable residential section. Home well-furnished with evidences of an adequate cultural environment. Toys, hobbies, play equipment observed. Father in government service; mother a housewife. Family income above $5,000. Both parents are high school graduates. Family appeared close-knit with all participating in its activities and in the responsibilities. The special placement was sought by the parents although there was some ambivalence toward it.

Medical Condition. Quiet, even-tempered child apparently in good health. Difficulty in following directions and behavior comparable to a child under 3 years. Speech not clear. Hearing impaired. Receiving thyroid medication. Diagnosis: mental retardation, etiology not known.

Psychological Findings. Entrance S-B 57 I.Q.; terminal S-B 63 I.Q. Initially, functioned intellectually in the educable range and this level maintained using the same tests. Using other measurements, the functioning level ranged from low average to trainable. Since there is a hearing loss and retarded speech development, there is a question as to the relationship of these conditions to the pattern of variability and fluctuations. A higher potential functioning level is suspected.

Speech and Language. Initially rated unintelligible in speech, there was a gradual steady measurable improvement. Although speech still infantile, highly non-fluent and voice continued to be monotonous, articulation, vocabulary comprehension, fluency and language ability showed improvement. V.A. increased from 2-11 to 4-3; L.A. from 2.0 to 3.9.

Extent of Growth and Development. Although handicapped by a hearing impairment, participated in all group activities, enjoys all art media and, at times, took a leadership role in activities. Cautious on stairs, but showed skill in use of large muscles. Mastered self-care. Needs further vocabulary and language building, but ready for reading. Follow-up placement: CRMD class. W.R. achievement: spelling 1.0, oral arithmetic 0.2, reading 1.1.

Child 49: Male, age 5-3, white, Protestant, English speaking, 244 days; terminal age 7-4.

Socio-economic status. Older of two children living with natural parents in an orderly, well-furnished apartment. Books, toys and other stimulation in evidence. Father and mother are college graduates. Father a member of a profession with income in excess of $10,000 a year. Both parents felt Project program urgently needed to aid in social adjustment and speech. Severe parental tensions accompanied the fear that child might be a "freak."

Medical Condition. Generally good health. Although birth spontaneous at full term, infant was pallid and resuscitated after six minutes. Diagnosis: Retardation resulting from brain injury caused by anoxia.

Psychological Findings. Entrance S-B 57 I.Q.; terminal S-B 66 I.Q. During first six months, showed an intellectual functioning gain of 11 months from educable to high educable, which level held. Fair amount of variability found from test to test during participation; psychomotor abilities poor. Emotional factors thought to be reflected in the variability.

Speech and Language. At entrance, speech rated unintelligible with many sound substitutions and omission. Ratings varied from one test period to another, but there was a gradual improvement. Steady improvement in vocabulary comprehension and sound discrimination. Hyperactivity and shouting decreased, paralleled by better voice quality. V.A. changed from 3.5 to 6.8; L.A. from 3.2 to 4.17.

Extent of Growth and Development. Progress in all oral language activities as well as in art and music. Interest in dramatization developed. Moved successfully from solitary play to group participation and slowly from earlier shyness to quietly joining activities. Showed a new self direction. Liked to use tools and worked hard in improving coordination. Developed interest in swimming. Has not mastered all self-care skills, but competency increasing. Follow-up placement: CRMD class. W.R. achievement: spelling 0.0, oral arithmetic 0.9, reading 0.0.

CHAPTER 4

INSTRUMENTS AND TECHNIQUES OF EVALUATION

The Mental Retardation Project has been basically a study of effects,- (1) the effects of planned group participation upon individual adjustment; (2) the effects of the structured training program upon individual learning; (3) the effects of the above (1) and (2) upon later school adjustments and learnings; and (4) the effects of parent attitudes upon child development when mental deviations are involved. In order to fulfill the obligations of this cross-sectional longitudinal study, it has been necessary to predicate findings upon an orderly and extensive system of evaluations. These have included regular, periodic health appraisals, measurements of intellectual, social, behavioral, sensory-motor, speech and language functions, learning aptitudes and achievement together with estimates of parent acceptance.

As the result of the organized and systematic data collected and the interpretation of these data, it has been expected that this study of effects would produce sufficient valid information to permit the development of:

(1) appropriate teaching methods and materials for use with young educable mentally retarded children.
(2) hypotheses regarding the developmental patterns of growth and achievement in young educable mentally retarded children.
(3) recommendations for further research in the area of young educable mentally retarded children.

Within this framework of objectives and goals the system of evaluations was established, (1) to respect the need for tests amenable to repeated use for routine periodic retest in this longitudinal study and (2) to study as many aspects of the subjects as possible, such as, their backgrounds and alterations in behavior and performance, in order that this knowledge might contribute to the evaluation of an educational program for them. In addition to the tests and measurements, detailed records have been maintained of the curriculum, classroom techniques used in the experimental classes, and the progress attained in each activity included in the class program.

I. TECHNIQUES AND PROCEDURES FOR EVALUATION OF SUBJECTS.

Experimental Class Subjects

As has been reported previously certain procedures used in the initial screening comprised a portion of the first comprehensive evaluation for subjects accepted, including the Revised Stanford Binet Intelligence Test, Form L, social data supplied by the parents, and the medical examination made by a pediatrician. The total initial study together with extensive periodic reevaluations comprise the continuing comprehensive study of each participant.

Psychometric Measurements. Very soon after a child was enrolled in a project class, the first battery of psychometric tests was administered. This battery consisted of the following:

(1) Revised Stanford-Binet Intelligence Test, Form L
(2) Merrill Palmer Scale
(3) Columbia Mental Maturity Scale
(4) Goodenough Draw-a-Man Test
(5) Strauss Marble Board
(6) Knox Cube Imitation Test
(7) Color Discrimination Test
(8) Rail Walking Test
(9) Laterality Test
(10) Weights Test
(11) Imitations Test
(12) Cutting Test
(13) Designs Test

(Directions for tests numbered 7 through 13 above are detailed in Appendix A.)

During the first year of the Project, active experimentation was ongoing with a number of tests, and the final stabilization of the battery was not achieved until the Spring of 1958. Since the first year was essentially an exploratory one, it may be accurately designated as the pilot phase of the Study insofar as psychometric tests were concerned.

Tests of general ability. There was no question about the initial use of the Revised Stanford-Binet and the Merril Palmer. The former has a proven reliability in discriminating between levels of brightness, has a high correlation at the lower limits between total scores and item scores, and has a lower chronological limit of two years. It was chosen as the basic screening and evaluating tool, although it is highly verbal, requiring not only verbal responses but also verbal comprehension, discrimination and reasoning. The Merrill Palmer Scale compensated for the highly verbal material of the Binet in that it has more manipulation and non-verbal items, and, in addition, has a lower limit of 18 months and is attractive to young children. Its scores correlate significantly with those for the Stanford-Binet. These positive qualities seemed to justify its use even while recognizing the low ceiling.

The Wechsler Intelligence Scale for Children was included experimentally the first year, but did not prove suitable for the subjects. In contrast, the Columbia Mental Maturity Scale was maintained in the battery despite some historical evidence that it yields unreliable results as a measure of general intelligence for retarded children. It was known that a revised form of the Columbia would be released during the Spring of the first year of the Mental Retardation Project and, therefore, it was included. As a strictly performance measurement, the battery included the Knox Cube Imitation Test involving manipulation, perception and comparison from which a mental age is determined.

Tests of Specific Abilities. Several tests and scales were chosen to obtain more specific information and to measure particular abilities. The Strauss Marble Board, designed to differentiate brain injured children from familial retarded, was administered to each group. Another technique, a simple set of designs to be copied, devised by Dr. Irving Lorge, was used to appraise the organization of the child. The purpose here was to study not only possible indications of brain damage but also of schizophrenic disorientation. With similar interests the Imitations Test was included.

Four of the measurements selected were directly related to the readiness emphasis of the experimental program, namely, laterality, colors, cutting, and drawing. The test constructed to determine lateral dominance is similar to the laterality tests in the Monroe Reading Aptitude Tests and to the Harris Test of Lateral Dominance, which is more difficult. It was included to provide specific information concerning the development of dominance in young mentally retarded children and the possible relationship of evolving stabilization in lateral dominance to academic readiness. The cutting test afforded a simple evaluative technique related not only to motor coordination and manual dexterity but also to visual perception, and offered ample opportunity in a pre-school setting to study the practice effect upon refinement of production. The third curriculum oriented measurement, color naming and matching, had a two-fold purpose, first, as a rough measure of primary color discrimination, thereby ruling out gross color blindness, and second, as a measure of ability in verbalization of color perception. The second correlated directly with the school program where considerable attention was given to use of colors in the classroom activities, and, therefore, an initial knowledge of each child's perception of color as well as his ability to identify primary colors could contribute to program structure and evaluation of learning. A final curriculum oriented measurement was the Draw-a-Man Test. Although this is traditionally accepted as a measure of intelligence by drawing, it was used in the Project to provide information concerning motor coordination, perception and artistic ability.

Another test of discrimination was the Comparison of Weights. The test used was the weight sub-test in the earlier Binet scale, which was still retained in the Stanford revision of the Binet-Simon Intelligence scale at the five year level. This technique involves visual and muscular discrimination, but, more important here is its measurement of comprehension of directions and an ability to control ones interest in the objects themselves in order to reach the goal.

The final Project psychometric technique was the Rail Walking Test. After experimentation with the Oseretsky Tests of Motor Proficiency as well as with the Sloan and Lincoln revisions, all of which were found to have directions which were too complicated for use with young mentally retarded children, the rail walking test alone was used.

The psychometric battery was administered each year in the Fall and Spring, although deviation from this schedule was necessary at times in individual cases because of absences occasioned by illness. After a child completed the Project program and was transferred elsewhere, the psychometric battery was given annually during the follow-up period.

Medical Evaluation. Following the initial pediatric examination, each child enrolled in the experimental classes underwent a thorough audiological examination. When a need was indicated, neurological and laboratory studies were made using the clinical facilities of available specialized medical centers. The findings from the current health appraisals were supplemented by previous medical history secured not only through parent interviews but also through the cooperation of family physicians, consultant specialists and hospital administrations. This sequential health data afforded a relatively complete picture of each child's physical condition and health status, insofar as it could be obtained, from birth until the time of Project participation. Semi-annually there was a reappraisal of the physical health of each child in addition to routine daily health inspections. Throughout the study health records were maintained, including reports at regular intervals on weight, height and body measurements. Full length photographs against a standard grid were taken of each child every six months, giving a pictorial record of growth and change all of which were a part of the cumulative data for each subject.

Social and Behavioral Appraisals. Paralleling the psychometric study of each experimental subject was a regular periodic appraisal of the social and behavioral status. These evaluations utilized the following:

(1) Modified Vineland Social Maturity Scale
(2) Structured Home Interview
(3) Behavioral Schedule

The Social Maturity Scale was completed by parents, teachers, observers, social worker, and other members of the Project staff who had sufficient contact with the child to be informed about the items covered. These forms were used during the first three weeks after admission and during the last three weeks of the school year. The initial composite estimate of social maturity provided information for early program planning as well as a base from which to measure later change and development.

A second technique was the structured interview which the Project social worker held with the parents in the home during the first semester following admission. Not only was a questionnaire completed at the time, but a written observational report was made about the visit, including general impressions and supplemental findings. This visit took place when the child was at home and provided an opportunity to observe objectively the functioning level of the child in his home environment.

The Behavioral Inventory was constructed for the Project as a qualitative developmental portrait of children and was used by teachers and observers three times each year. It covers such areas as, general levels of activity, responsiveness, effort; ability to follow directions, to postpone pleasure, to relate to other children; attention span; methods of communication; sensitivity to stimuli; and intellectual level in terms of concepts of time, numbers, letters, curiosity. To a degree, it also served as a measure of group learning. Since this was completed regularly in February and June, it provided further longitudinal data. Although this inventory was newly constructed and lacked the refinements of proven techniques, it seemed to contribute needed orderly sequential information about the subjects not provided elsewhere.[5]

Speech and Language Evaluation. The battery of evaluative instruments and techniques employed by the language developmentalists twice a year were:

(1) Phonetic Inventory
(2) Spontaneous Language Test
(3) Auditory Memory Tests
} recorded on tape
(4) Peabody Picture Vocabulary Test
(5) Preschool Sound Discrimination Test
(6) Mecham Verbal Language Development Scale

(See Appendix A for further information about the taped tests.)

Taped Speech and Language Tests. The taped tests have certain complimentary characteristics and provide precise data for longitudinal evaluation. The Phonetic Inventory is accomplished through response by the subject to a series of pictures, and the tapes may be subsequently audited or transcribed for analysis to establish the individual articulatory pattern. The items include selected cards from the *Bryngelson-Glaspey Speech Improvement Cards* (Scott, Foresman and Company), the *Picto-Word Flash Cards, Set I* (F. A. Owens Publishing Company) and items dedeveloped by the Project staff from materials published by the Educational Division of the National Dairy Council. This Inventory has been judged to be an adequate test of the articulation of the twenty-five English consonants as these sounds occur in the initial, medial and final positions of words.

The Spontaneous Language Test supplements the Phonetic Inventory by taping the child responses to six pictures of children's activities. The transcriptions of these responses afford a further check on articulation as well as on vocabulary, voice quality and the level of grammatical development. These items were compiled by the Project Staff from materials of the Educational Division of the National Dairy Council.

---

[5] The data obtained from the Behavioral Inventory were helpful to teachers and to other staff working with the children. However, this new instrument, designed under the direction of the late Dr. Irving Lorge, and for which limited information is yet available concerning scoring and interpretation, seems to merit a somewhat different consideration. For this reason, a report on the use of this instrument and its results will not be made at this time.

The Auditory Memory Test has two parts. First, the child repeats 16 vowels and dipthongs and 25 consonants after the tester. In the second half, the child repeats after the tester a group of two, three or four sounds. The total test, therefore, is a means of evaluating the child's ability to articulate sounds in isolation as well as his auditory memory. It has been found that inability to repeat such sound groups is related to infantile speech patterns[6] and, also, that deficient auditory memory span may be associated with incomplete development or injury to the parts of the brain controlling auditory memory.

Scored Speech and Language Tests. In addition to these taped evaluations there were three other individually administered tests in the speech and language battery for which scores were obtained.

The Peabody Picture Vocabulary Test consists of a series of plates arranged in ascending order of difficulty, with the picture chosen by the child corresponding to a spoken word he hears. This comparatively new measurement for vocabulary comprehension is simple to administer and illustrations used are large, uniform in size and relatively free of figure-ground perception problems. And, it is one of the few instruments available for this purpose which was constructed especially for use with mentally retarded and brain injured children. A scale is provided by which the raw score can be converted to a Vocabulary Age. Although later refinements of this test have established its ability to obtain a M.A. score, its purpose in this study was limited to measurement of vocabulary comprehension.

The Templin Preschool Sound Discrimination Test is a means of testing the acuity of a child for different sound in speech. Despite the fact that each page has only two pictures from which to choose and these may vary in size, color intensity and type drawings, which can present problems for children considered to be brain injured, the test is established as being especially well suited for young mentally retarded children.

The Mecham Verbal Language Development Scale actually is an extension of the communication portion of the Vineland Social Maturity Scale. The 50 items are related to listening, speaking, reading or writing abilities with a score sheet provided which lists the types of behavior to be credited. This total score then can be converted to an equivalent Language Age. Although several problems exist in the use of this test, i. e., the length of the observation, the extent of verbal language involved, and the subjective tester judgments required in certain items, it still has been considered to offer helpful data.

Each of the measurements used in these evaluations as well as teacher and observer reports have contributed to testing the hypotheses initially established in the area of speech and language, namely,

1. An increase in extent and quality of the speaking vocabulary.
2. An increase in number and quality of English sounds articulated and used correctly.
3. An increase in auditory memory ability.
4. An increase in auditory discrimination ability.
5. An increase in the complexity of oral grammatical use.
6. An increased relevance of oral language to the situation.
7. An increased amount of oral interchange between the subjects and others per unit of time and under similar circumstances.
8. An increase in intelligibility of oral language.
9. An increase in extent and quality of concepts mastered.
10. A higher level of abstraction during the process of oral statement of ideas, feelings and attitudes.
11. A longer listening span manifested by the subjects.
12. An increased subject awareness of the value of oral communication.
13. A decrease in dependence on non-vocal communication.

Upon the basis of the evaluation findings, the speech and language development program for each child was determined and later modified or changed according to the identified needs.

Learning evaluation. The structured measurements of learning readiness and achievement were:

1. Mental Retardation Project Developmental Curriculum Scale
2. Wide Range Achievement Test

---

[6] Robert West and Carr Ansberry. Rehabilitation of Speech. (3rd Edition) Harper and Bros., New York. 1957. The authors report that a normal child of three should be able to recall two sounds and a child of eight years, between two and three sounds.

The MRP Developmental Curriculum Scale was developed during the initial phase of the Study, being constructed in conjunction with the evolving pre-school curriculum. This 5-point scale for evaluating growth and learning covers seven broad areas of development and provides a sequential record of progress as well as a profile of total growth in all of the areas of emphasis. Following the introduction of this scale, it was used by teachers three times each year. (More detailed information concerning the scale can be found in the Curriculum Report.)

In addition to the Curriculum Scale as a structured technique for evaluating learning, continuing anecdotal reports were maintained by teachers and motion pictures were made of classroom activities. This latter procedure was primarily a visual aid to recall rather than a formal evaluation technique, enabling teachers and staff to follow the subjects pictorially from early program participation through class reunions during the period of follow-up.

Directly related to the functions of evaluation were the reports compiled by two observers stationed in an adjacent monitoring booth. Here observations on interactions in the classroom (teacher-pupil, pupil-pupil and teacher-teacher) were made on a regular daily schedule utilizing a variety of methods. Since a careful review of the literature did not reveal any techniques of proven merit for classroom observations, a number of approaches to this were taken on an experimental basis during a three year period. Throughout this activity, it was hoped that the reactions of children in the class, their responses to the group, and their individual growth patterns could be recorded and utilized in curriculum planning and development.

A final learning evaluation employed in the study occurred in the first semester of the 1961-1962 school year after all Project subjects had been transferred to other programs. At that time, the Wide Range Achievement Tests were given to each former Project enrollee together with others in the class to which he was assigned. The purpose of this final evaluation of learning was, (1) to determine the level of individual achievement by the Experimental Project subjects and (2) to compare each child's achievement with that of his peers in the same class program.

During the initial pilot year of the Project, experimentation was carried on with use of the Metropolitan Readiness Test and the Gates Reading Readiness Test. Both were discontinued because of the difficulties encountered in their use with young mentally retarded children.

Through the employment of a variety of reporting and recording techniques for the subject population during the four years of this longitudinal study, an effort was made to detect and to study not only major changes and developmental patterns, but also the more subtle variations and modifications in behavior and performance which could be significant were they noted and remembered. To a reasonable extent, it is thought that the evaluative methods and procedures succeeded in recognizing both major and minor evidences of change.

Parent Attitude Studies. Following the initial interview held by the social worker with the parents, structured parent interviews were conducted at the end of the first year, at the time the class program was completed, and as a part of follow-up routine. One home visit was made during Project class participation. Specific questions strategically introduced during the interviews were designed to elicit attitudinal information concerning the child, his disability and the parent hopes, expectations and concerns about him. In addition, the parents of participating children completed brief daily report forms throughout the enrollment period, and each month parents and teachers met together in an informal session for the purpose of exchanging information and understanding Project program activities. As a result of these contacts, the attitudes of participating parents were identified and studied, while at the same time, these parents were being exposed regularly to opportunities for knowledge and increased understanding.

CRMD Comparison Subjects

As was described in Chapter Two, the comparison subjects were evaluated for admission to the Study on the basis of essentially the same criteria as were used for the experimental subjects. The pattern of similarity in treatment continued throughout their participation with only limited modifications for this group.

Comprehensive and Continuing Evaluation. The comparison group were studied using the same psychometric battery and the same speech and language battery as had been employed for the experimental enrollees, but the schedule for administration was once a year, the same as for the follow-up of Experimental subjects. Similarly, the social worker held one home interview with the parents of each child, and, since this was during the day, usually the father was absent. The modified Vineland Social Maturity Scale was completed in the same manner as for the experimental group, including reports from Project staff concerned, parents and public school teachers. Through cooperative arrangements with the

Bureau for Children with Retarded Mental Development, the public school teachers supplied necessary information and maintained pertinent records for both the Project follow-up subjects and the CRMD subjects and cooperated in evaluation of classroom activities.

As the result of these appraisals of learning and adjustments, it was possible to obtain sufficient data for a comparison of the growth and development of the two groups of children.

II. TECHNIQUES AND PROCEDURES FOR PROGRAM EVALUATION

Since the development of a curriculum for young educable mentally retarded children together with improved techniques for teaching these children was the prime objective of this Study, a determination of the effectiveness of the program which was developed in the experimental classes has been a major concern. In effect, the evaluation of child growth and development and of adjustments achieved were also evaluations of curriculum adequacy, while the study of the amounts and kinds of classroom learnings for each child has been an efficiency measurement of the classroom activities to which children were exposed. In like manner, any change which has occurred with regard to parent acceptance of their mentally retarded children has constituted a tool for appraising the merits of the training program in which these parents were active participants.

Recognizing the interrelatedness of any evaluations of child growth with those of program effectiveness, there were several measurements employed in the Project which were designed to estimate the extent to which the program structure accomplished what it was intended to accomplish.

Curriculum Effectiveness

Since the general curriculum design was oriented around the broad concept of human interrelations, the assumption, supported by measurements of readiness, has been that youngsters with mental ages roughly between less than 3 years and nearly 5 years have the ability to learn to function constructively within this goal. Then, for practical purposes of implementation, this general objective was broken down into seven areas of learning, namely, (1) self-help; (2) social development; (3) emotional development; (4) imagination and creative expression; (5) manipulative development; (6) motor development; and (7) intellectual growth. Classroom planning, the maintenance of anecdotal records, planned activities as well as unstructured situations for expression, all were designed to provide opportunities for new learnings and for reinforced learnings within these seven areas of curriculum emphasis. A curriculum guide was developed in order to further both orderly planning and implementation.

To determine the degree to which the program was progressing toward its purported goals, a curriculum scale was constructed designed to give indication of each child's development in activities, skills and other areas of growth which can be reflected in the classroom. In this scale, each major area of learning included a number of specific items, each of which was reduced to five developmental steps which the consensus of teachers and consultants believed to constitute sequential growth. No attempt was made to confine the achievement of all five steps in these items to the two years of participation in the Project classes, but rather it has been felt that the follow-up study of these children might show ongoing progressive development for longer periods of time. (See Report on Curriculum for further information).

A second facet of program evaluation has been related to the hypothesis that such adjustments as these reflected in social and behavioral patterns can be encouraged and developed with young educable mentally retarded children, and that this can be accomplished to such a degree that subsequent adjustments in school will be furthered. For this reason, a considerable amount of attention was devoted to this area of growth through classroom activities, with the curriculum scale reflecting its importance. In addition, the modified Vineland Social Maturity Scale was employed as another instrument for evaluating individual development and for identifying problems needing special attention in the classroom. Recognizing the difficulties implicit in an arbitrary judgment of what constitutes socially acceptable behavior, it was felt that the frequency of occurrence of different types of behavior could provide helpful knowledge of a child and of his needs.

Still another aspect of program evaluation concerned the relationship of child growth and learning to parental attitudes about the child and his mental deviation. Stated reactions of parents recorded in social worker reports, periodic meetings of teachers and parents, and daily written home reports on each child, all were directed toward maintaining a positive relationship between parent and child rather than toward changing attitudes. In contrast with older mentally retarded children who have reached a special class placement after a series of failures, which frequently become associated with parent failure, the Project subjects were attending classes for the first time and their identity as being retarded was relatively new. Parents were at the stage of questioning the accuracy of such a diagnosis, of wondering what it meant, and of seeking understanding. For this reason, it was anticipated that the Project studies might reflect the influence of evolving comprehension and knowledgeable acceptance of children by their parents rather than any significant change in attitudes. On the assumption that the degree of parental acceptance might be correlated with the rate and quantity of child growth and learning, the development of attitudes of parents assumed importance in program evaluation.

Turning to the premise that learnings and adjustments once begun would continue on in subsequent school placements, provisions for follow-up of children completing the experimental program included periodic ratings. As the individual child's growth in the new school situation was measured, the Project program he had recently left was also being evaluated. To the extent that he was making satisfactory adjustments in the new school environment, his preceding experience would appear to have constituted constructive preparation for it.

Comparative Data

In order to have a basis for comparison in evaluating the child's subsequent learnings and adjustments, the CRMD subjects were studied and their progress charted and evaluated. To the extent that these comparative data were available and utilized, a reasonable control was available.

Since the CRMD group were a little older than the experimental class transfers, a retrospective aspect to the study was introduced by comparing the level of achievements of the Project experimental subjects with that of the CRMD subjects when they were the same age. Because of this age factor and the nature of the age-matches, there was a basis for comparison of Project subject development and adjustment with two maturational levels, (1) the retrospective data available for the CRMD subjects and (2) the current data for the same group.

Summary. Each aspect of the several categories of findings have been investigated. As a result, extensive data have been collected pertaining to the horizontal study of the adjustments and adaptability and of the learnings and growth for a sample of young educable mentally retarded children, together with a longitudinal pattern of development and change. In this way, the cumulative quality of learning and the effects of integrated growth have been regarded as an important consideration in the appraisal of findings and in the analysis of data which the Project has produced.

CHAPTER **5**

RESULTS OF THE STUDY: REPORT ON THE ANALYSIS AND INTERPRETATION OF STATISTICAL AND DESCRIPTIVE DATA

The report on the longitudinal data obtained in this study consists of, (1) statistical findings related to both the experimental subjects and the CRMD comparison subjects and (2) descriptive findings that do not lend themselves to statistical handling. The four classes who completed the Project experimental program as well as the participating pupils enrolled in public school CRMD classes, have been studied in several groupings during the analysis of the findings, the results of which are here reported. First, total longitudinal data are given, considering each subject population as a whole. Second, each year has been examined separately in a cross sectional analysis. Third, children have been grouped according to rough socio-economic classifications, namely, a lower socio-economic category and a higher socio-economic category. When the latter procedure has been employed, the criteria arbitrarily used have been:

a. Lower group. parents with incomes under $5,000.00 a year; education below that of high school graduates; and residence in a slum or in other substandard housing.
b. Higher group. parents with incomes of $5,000.00 a year or more; education at the level of high school graduates or above; and residence in areas of the City and in housing above that of slum level.

In cases where all three criteria were not met, a judgmental decision was made based upon two out of three of the criteria as indicating a trend. A fourth method used in treatment of data has been to group subjects according to Stanford-Binet scores on initial tests. A final procedure has been to study a single class group for a specific year in isolation from the other experimental subjects.

The report which follows may be related to Chapter Three, Part II, where a random sample of summarized case studies is given for individual children in the experimental subject population.

I. REPORT ON STATISTICAL RESULTS

The total subject population of 54 children completing the experimental pre-school curriculum is comprised of the following: 11 in 1958, 15 each in 1959 and 1960, and 13 in 1961. The comparison group consisted of 28 pupils in CRMD classes who entered the study in the Fall of 1958.

Data for the first Project year, 1957-58, show fewer tests administered because of the Pilot aspect of that year. Evaluative tests and techniques were in process of development and selection and, therefore, were not uniformly employed as a complete battery until the Spring of 1958. For the 1961 group, Project participation terminated at the end of the school year, in June, and follow-up of these subjects is limited to the achievement test administered to all available participants in the late Fall of 1961.

Chronological Ages

The two year eligible span in chronological ages for experimental subjects, 4 years 9 months to 5 years 9 months for the younger class and 5 years 9 months to 6 years 9 months for the older, gave a somewhat varied mean age in each year's group as well as an overall age variable, which is shown in Table 4a. The extent of the variability can be seen in detail in Table 4b. It may be noted further that the 1958 subjects were slightly older than those for the other three years with a mean admission CA of 6 years 2 months in contrast with the overall total mean admission CA of 5 years 8 months. Attention is called to the somewhat older age of the CRMD participants.

General Intellectual Ability

Following the test experimentation during the pilot period in the early months of the Study, the tests of mental ability consistently

Table 4a

Mean Chronological Age for All Subjects Reported by Project Completion Year and for Total Participants According to Socio-Economic Groups

1958-1961

Year	No. Children	Mean C.A. of Subjects Admission	Exit	Last Follow-up
1. Total Experimental Classes				
1958	11	6-2	6-9	9-5
1959	15	5-8	6-11	8-8
1960	15	5-6	6-11	7-9
1961	13	5-7	7-0	xxx
Total Mean	xxx	5-8	6-11	8-6
Socio-Economic Groups (Lower)				
1958	8	6-2	6-10	9-6
1959	8	5-7	6-10	8-7
1960	8	5-7	7-0	7-9
1961	9	5-8	7-1	xxx
Total Means	xxx	5-9	6-11	8-7
(Higher)				
1958	3	6-0	6-6	9-2
1959	7	5-8	7-0	8-9
1960	7	5-5	6-11	7-9
1961	4	5-4	6-11	xxx
Total Means	xxx	5-7	6-11	8-4
2. CRMD Comparison Group	28	7-10	xxx	9-10
Lower	16	7-12	xxx	9-10
Higher	12	7-9	xxx	9-9

Table 4b

Distribution of Chronological Ages (year - month) at Time of Admission for Project Subjects Who Completed the Experimental Program and CRMD Subjects in Comparison Group

Project Class Year	4-9 4-11	5-0 5-2	5-3 5-5	5-6 5-8	5-9 5-11	6-0 6-2	6-3 6-5	6-6 6-8	6-9 6-11	7-0 7-2	7-3 7-5	7-6 7-8	7-9 7-11	8-0 8-2	8-3 8-5	8-6 8-8	8-9 8-11	9-0 9-2	No.
1958					5	2	1	2	1										11
1959	1	4	2		4		2	2											15
1960	1	3	1	5	2	2	1												15
1961		2	3	4	3	1													13
CRMD								1		3	5	3	2	5	2	4	1	2	28

Chronological Age Groups (year - month)

employed were: Revised Stanford-Binet Intelligence Test, Form L, The Merrill Palmer Scale, the Revised Columbia Mental Maturity Scale (introduced in the spring of 1958), and the Knox Cube Imitation Test.

The tabulated results obtained for the Stanford-Binet, the Merrill Palmer and the Columbia are given in Appendix C. The total data for the three test periods reported, namely, admission, exit and final follow-up are available only for the Stanford-Binet. As was reported previously, the first testing period for the 1958 class did not include the latter two tests since the full test battery was not in use on a routine schedule until the spring of 1958. There also was no follow-up period for the 1961 class. Since the Stanford-Binet data are the more complete, these have been analyzed more extensively, including consideration of possible differences which might be identified between the socio-economic levels within the groups. The variability in results from the several tests may be seen in these data as well as that shown for the same measurement in the test-retest results.

Stanford-Binet. It may be noted that, for the most part, the overall mean I.Q. gains on the Binet for the experimental subjects were not dramatic but gains were shown for each year's class, ranging from 2.7 to 6.3 points from admission to last follow up. However, during the actual Project class participation, the mean increments were somewhat greater, being from 4.5 to 7.9 points. In contrast, only one group showed a mean I.Q. gain (1.1 points) while two groups showed a mean loss (minus 2.0 and minus 1.1) between Project class exit and the last follow-up for the three groups followed. This latter decrement is more comparable to the pattern shown for the CRMD comparison group, who also showed a mean loss of one point from first to final testing.

In mental age, the experimental subjects showed a consistent positive growth in each class with a mean gain for the total group from entrance to exit of 14 months and from admission to final follow-up of 25 months. Chronological age change from entrance to exit was 15 months and to last follow-up 34 months. The comparison group gain was less with the M.A. mean change being 14 months during the three years they were followed, while C.A. growth was 23 months.

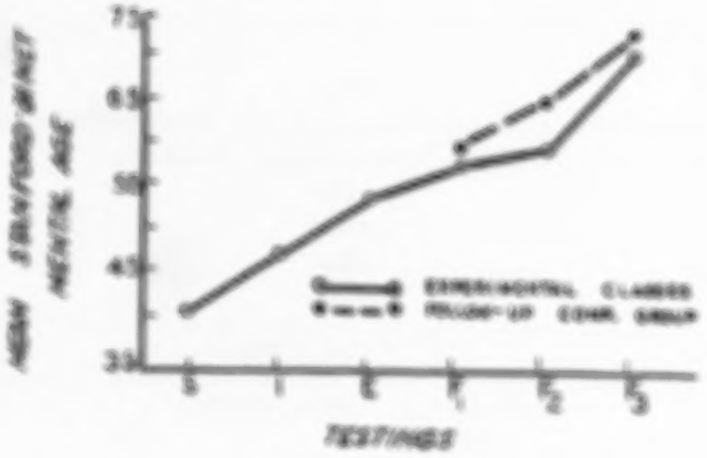


Chart 1 - Mean Changes in Mental Ages for Experimental and Comparison Subjects Obtained from Sequential Testings with the Revised Stanford-Binet, Form L. 1958-1961.

There is, however, a problem in interpreting increases in either I.Q.s or M.A.s for a group such as this subject population because of the regression effect, and this investigation is dealing with a set of initially low scores. A further consideration is the recognized instability of both I.Q.s and M.A.s for young children although there is greater instability of scores for bright children than for either average or dull children, which fact has been recently substantiated in the analysis by Pinneau of the Berkley Growth Study data.[7] Adding to these restrictions upon interpretation the limited predictive value of mental tests in the early years, one can only report initially measurable status and changes recorded without attaching too great weight to their possible ultimate significance.

Divided into two socio-economic groups, the experimental subjects in the higher category showed a mean I.Q. gain of 5 points from admission to exit; the lower group added 6 points. In follow-up, the former gained one point for a mean overall gain of 6 points, while the latter dropped 3 points, for a mean overall gain of 3 points. For the comparison subjects, however, the reverse was true. The lower group held their mean I.Q. consistently during three testing periods, but the higher socio-economic subjects had a mean loss of 2 I.Q. points.

Samuel R. Pinneau. Changes in Intelligence Quotients; Infancy to Maturity. Houghton Mifflin Company. Boston, Mass. 1961.

In a separate investigation of the repeated testings for the 1958 group, where the children were slightly older in chronological age and for whom there is a longer follow-up period, an analysis of variance for the Stanford-Binet M.A. showed significant increments each year from admission through the final follow-up.

Comparisons made of the Binet I.Q. differences between first and second year tests for all available subjects did not prove to be statistically significant. A comparison of this difference for the 1958 group with that for all other subjects combined was in a positive direction, but did not attain significance. In a similar comparison of the Binet M.A. between first and second year tests for all subjects, the over-all increment was highly significant at the .001 level. However, an investigation of the 1958 group for this period in comparison with the other groups did not show significant difference, a gain of approximately six months for each.

Since the 1958 group was unique in that it completed the experimental program during the pilot year and the 1961 group differed because there was no follow up period, the 1959 and 1960 groups were combined and the Binet I.Q. data investigated from admission through termination. These subjects showed a significant I.Q. increment at the .05 level between admission and exit similar to that for the 1958 group, but, in contrast, did not show a statistically significant gain during follow-up, although it was in a positive direction. In an analysis of variance for repeated tests for the combined 1959-1960 groups, the M.A. change was highly significant at the .001 level, both from admission to exit and from exit to follow-up.

In light of other studies in which a greater I.Q. increment was found following a preschool program with young retarded children, the lack of statistically significant gain for this group invites questioning study. One possible influence may be the character of the group. For example, the Kirk study went directly into the community for selection of subjects, while this Project was built upon subjects selected from agency referrals. In short, the pre-school children reported here had drawn sufficient attention to their differences to be known to a medical, social or educational agency or service, which raises still another question as to the comparability of young mentally retarded subjects in various studies.

Merrill Palmer. Despite the greater fluctuation of I.Q. scores obtained from the Merrill Palmer in comparison with the Binet, including a higher prevalence of those in the upper retarded and low normal range (see Table, Appendix C), the mean Merrill Palmer I.Q.'s do not differ appreciably from those obtained on the Binet. And, these characteristics in the results are consistently true for both the experimental and comparison subjects, with, perhaps, even greater evidence of the fluctuations in the latter group. Interestingly enough, any tendency toward an initial scoring advantage from this test seemed to be with the lower socio-economic subjects rather than with the higher group. The tabulated mean scores in Table 5 show this difference. Overall, the Merrill Palmer M.A.s tend to be similar to those from the Binet except in the early tests for the CRMD lower socio-economic level, which were approximately 6 months higher on the Merrill Palmer. This difference, however, did not continue in the final test.

Table 5

Mean Scores on Revised Stanford-Binet, Form L, and Merrill Palmer at Three Testing Periods for Experimental and Comparison Subjects According to Socio-Economic Levels

Subjects	Mean I.Q. Scores					
	Revised Stanford-Binet, Form L			Merrill Palmer		
	First	Exit	Final	First	Exit	Final
Experimental						
Lower Group	59	65	62	62	60	62
Higher Group	58	63	64	58	64	65
Comparison						
Lower Group	66	66	66	72	71	65
Higher Group	60	59	56	58	58	56

It is also observed that there is greater variability in the Merrill-Palmer scores and decrements tend to be larger.

In analysis of I.Q.'s obtained in the combined 1959 and 1960 experimental groups by the Merrill Palmer, intersubject variance is significant (.001 level). The mean scores from admission to exit increased 5.9 points while from exit to follow-up mean scores remain essentially the same (minus 0.2). In contrast, the lower socio-economic group made a total gain of 3.2 points and the higher group, 8.7 points. It is interesting to note, however, that the M.A. increments are not only significant (from admission to exit at the .001 level and exit to follow-up at the .01 level), but they are comparable to those derived from the Binet.

It seems safe to assume that two factors enter into the Merrill Palmer results, namely, the

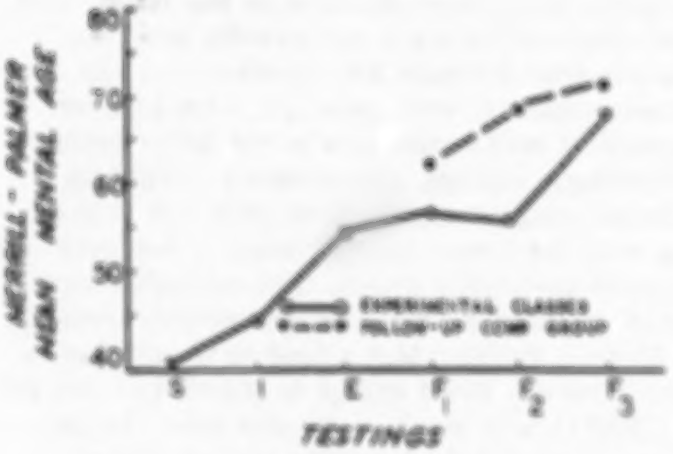


Chart 2 - Mean Changes in Mental Age for Experimental and Comparison Subjects Obtained from Sequential Testings with the Merrill-Palmer Scale, 1958-1961.

emphasis upon performances rather than verbal skills and the low ceiling. While the latter fact would appear to constitute a limitation, the former may be observed later to show a high degree of relevance when considering the actual growth and achievement of the experimental subjects in the class program.

Columbia Mental Maturity. Although the new revised edition of the Columbia was used experimentally, the results obtained have been interesting if not conclusive, first because of the more frequent occasions when it was reported that a child could not be tested with this measurement; second, because of the wide fluctuations in scores for some cases; and, third, the sprinkling of isolated high scores followed by a sharp drop at the next testing period. Here again, as with the Merrill Palmer, a somewhat greater advantage is accrued for the lower socio-economic experimental subjects in the mean scores. The tabulation of individual test scores is shown in Appendix C.

Table 6

Mean Scores on Revised Stanford-Binet, Form L, and Revised Columbia Mental Maturity Test for Experimental and Comparison Subjects according to Socio-Economic Levels

	Mean I.Q. Scores					
	Revised Stanford-Binet, Form L			Revised Columbia Mental Maturity		
	First	Exit	Final	First	Exit	Final
Experimental						
Lower group	59	65	62	71	72	66
Higher group	58	63	64	70	67	61
Comparison						
Lower group	66	66	66	66	68	64
Higher group	60	59	58	58	54	55

Because of the nature of the differences between results from the new revision of the Columbia and those from other tests used, it would be hazardous to attempt to interpret these limited findings. From this brief usage for a small subject sample, however, there is some reason to question the Revised Columbia as a suitable measurement technique for young mentally retarded children. More intensive study of these data also may be justified.

Knox Cube Test. The use of the Knox Cube Imitation Test to determine Mental Age on the basis of performance did not yield sufficient data for analysis, although in isolated cases there was progressive change. Thirty-three (over 60 per cent) of the experimental subjects scored a consistent zero, and another 18.5 per cent of the children gave only a single correct response in the entire series of Knox Cube Tests. From the comparison group, 12 children (43 per cent) scored zero, while 14 per cent had a single point each.

Within the restricted responses obtained, however, both experimental and comparison subjects did show identifiable gains in this function during the last follow-up. Since the comparison group was older chronologically and since a trend was noted in ability to perform the tasks of the test during the last test period, there appears to be a possibility that maturation may be a significant factor in the development of the skills required.

Specific Abilities

The tests and techniques employed in evaluating specific abilities are reported under the following categories:

1. Differentiation between brain injury, schizophrenic disorientation and mental retardation: Project Designs Test, Strauss Marbleboard and Imitations Test.
2. Abilities related to academic readiness: laterality; color discrimination and perception; cutting as a measure of motor coordination, manual dexterity and visual perception; and drawing as a measure of artistic ability, perception and coordination.
3. Comprehension of directions and ability to follow directions: comparison of weights (also, visual and muscular discrimination).
4. Motor proficiency: rail walking.

The report of this phase of the study considers each ability area investigated in the sequence given above.

1. Project Designs Test, Strauss Marbleboard and Imitations Test. Although the Designs Test was constructed for the Project and lacked proven validity or reliability, the findings were interesting. For this simple set of 15 designs to be copied, scores were obtained by crediting one point for each design correctly reproduced. (See Appendix A for test.) In Table 7, it can be noted that the substantially

higher mean score for the 1958 class appears to have a more direct relationship to chronological age than to I.Q. According to medical data available, the prevalence of neurological impairment is not lower in this group than in the others, nor is behavioral evidence of emotional maladjustment or illness. In an analysis of variance, the Designs Test showed a significant increment during the Project class attendance at the .05 level and between exit and follow-up at the .01 level.

Table 7

Comparison of Project Designs Test Mean Scores with Mean C.A., M.A., and I.Q. for Experimental and Comparison Subjects, 1958-1961

Experimental Subjects	Designs Test Final Mean Score	No. Tests Administered	Final Stanford-Binet Mean C.A.	Mean M.A.	Mean I.Q.
1958	8.3	3	9-4	5-8	62
1959	5.4	4	8-6	5-1	58
1960	6.7	5	7-8	5-2	67
1961	4.9	4	7-0*	4-7	65
Comparison Subjects	4.2	3	9-10	6-1	62

*Exit age, since there was no follow-up period for this class.

The responses given by the comparison subjects showed progressive improvement in design scores, which results were not inconsistent with the steady increments shown by the experimental subjects. The chronologically older comparison group, however, attained a substantially lower mean gain.

In contrast with the findings for the Designs Test, the standardized Strauss Marbleboard Test was essentially unproductive even in obtaining raw scores. For the experimental group, 76 per cent of the subjects yielded no score and a third of those scoring had one correct response. Studying these limited findings on the basis of socio-economic levels, again there were insufficient data for conclusions, although a greater percentage of failures to score at all was in the higher socio-economic group.

The Project Imitation Test was similarly unproductive with even fewer experimental and comparison subjects scoring. In this test comprised of 12 items, the subject was asked to imitate the mark made by the examiner, with one point credited for each correct response. After eliminating those who had a single correct response for the total series of tests, only [illegible] percent of the experimentals and 7 per cent of the comparison group remained.

The limitations in the results from this series of tests insofar as the latter two are concerned appear to invite further study of the measurements in relation to what they purport to measure and the chronological and intellectual (including motor skills) limits of their effectiveness.

2. *Laterality, cutting, colors and drawing.* Because the primary concern of this study has been curriculum development, the results of tests specifically related to the school readiness program are considered to be of major interest. A compilation of the data from these tests is given in Appendix C. It will be noted, also, that those results are reported in relation to socio-economic grouping as well as to I.Q. so that greater freedom may be exercised by the reader in reviewing possible influences.

The Project Laterality test consisted of 11 items related to hand, eye and foot lateral dominance with a tabulation sheet for marking responses in either the "R" or "L" column. The results for each test period were recorded as "Right," "Left" or "Mixed."

Although this series of tests shows no consistent pattern for the establishment of dominance among the experimental subjects, the results have appeared to be provocative. Since there seems to be no identifiable correlation in this group between mental ability and the establishment of dominance, a question is raised as to whether the stabilization of lateral dominance may not be more related to maturation associated with C.A. than to other growth factors. Only about 7 per cent of the experimental subjects showed any inclination toward a possible left side performance, while 28 per cent showed at least one test in which there was a right performance. This, too, is not unexpected if it is accepted that only about 4 per cent of the total general population has a left side dominance. Despite the preponderance of mixed scores, another consistent pattern has been that in no instance was there a change from right to left or left to right on the retests. Always one or the other was shown combined with mixed dominance.

In the case of the comparison subjects, the picture is somewhat different. There are 11 cases, 39 percent, in which a consistent right or left dominance is evidenced in every test. Another 6 cases, 21 percent, show initial mixed dominance and later clearly defined right or left, with a majority stabilizing with a right performance. In direct contrast to the experimental subjects, there are two comparison cases who show a L-R-M combination. (See tabulated scores in

Appendix C.) This pattern of response raises an interesting point as to possible environmental influences which might be in effect in these cases. Throughout the study of these data, there has been a recurring question as to when dominance is established in either the normal or the retarded population and by what process it is evolved.

For the Project Cutting test, consisting of six items the subject was asked to cut out of paper the forms provided. One point was scored for each success. Even though the initial item required only a simple cut in the first sheet of paper offered, it was found that this cutting test was not within the ability of almost one-third of the experimental subjects. It was, however, well within the ability of a large proportion of the comparison group. For the former subjects, those scoring a consistent zero and those having only one success in a series of from 3 to 5 tests totalled nearly 50 per cent, while the comparison subjects showed only 2 cases which could be similarly described. It is noted that the higher socio-economic comparison subjects performed less well initially, perhaps reflecting greater parental restrictions upon their use of cutting tools. The limited gains during follow-up seen in the experimental group could have been affected by practice, not only in repeated testing but also in the preschool program. As with some of the other measurements, there is a suggestion that physical maturation may be a primary factor in determining success, which possibility is not weakened by the patterns of responses and the percentage of successes in the older comparison group. As with the experimental subjects, this ability is stronger in the low socio-economic CRMD group than in the higher, but here, too, I.Q. has not appeared to be a critical determinant of success. (see detailed results of this test in Appendix C.)

The Color Test is made up of three subtests, color pointing (I), color naming (II) and color matching (III). In each of the first two subtests, one point is scored for each correct response for a total of seven colors. For color matching, colored pegs are used and one point credited for each peg correctly matched, using a total of six colors.

In contrast with the tests of lateral dominance and cutting, Project tests of color discrimination and color perception showed a high degree of progressive change for the experimentals. (See tabulated results of color tests in Appendix C.) For the comparison group, there was evidence of attained skill throughout all tests, with the ceiling reached in initial tests of pointing for 32 per cent of the subjects and of matching for 71 per cent. The types of experiences concerning colors and their use which might be expected to be more prevalent in the higher socio-economic community apparently did not affect this, since both social groups were comparable in type and extent of change. During the earlier tests, scores on color naming appeared to be related to Stanford-Binet I.Q. level, while scores during the later tests did not. This difference is not unexpected, however, for there is little variability of scores on the last testing. For the experimental subjects color naming evoked consistently weaker response than did identification by non-verbal means. The comparison subjects performed on a higher level in naming, but, as a whole, functioned below the test ceiling in this measurement.

Through a more detailed study of the 1959 and 1960 classes, trends noted in the study of the raw data were confirmed. Gains made during Project class attendance in color identification by pointing were statistically significant at the .01 level and those between exit and follow-up at the .05 level. Analysis of the color matching gains showed statistical significance at the .001 level during class participation, but not during follow-up. A comparison of subtest gains made by the CRMD group with those made by the experimentals shows that the CRMD increments on each subtest were highly significant beyond the .01 level.

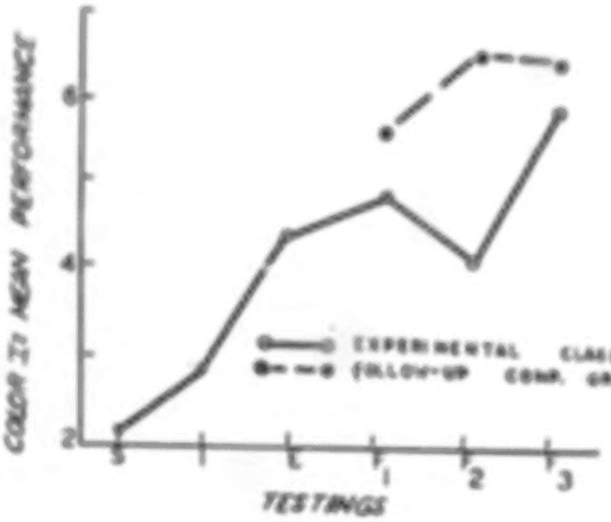


Chart 3 - Mean Changes in Scores on Color Pointing Test (Color I) for Experimental and Comparison Subjects, 1958-1961.

To what extent some of the performance differences between the two groups reflect maturation directly related to C.A. and to what extent possible unmeasured intellectual differences is not known. In either event, the progress observed during the Project class program and the gradual measurable gains made by the experimentals, which tended to close the gap between the two subject groups, suggest tangible benefits to the young mentally retarded children who participated in this pre-school program.

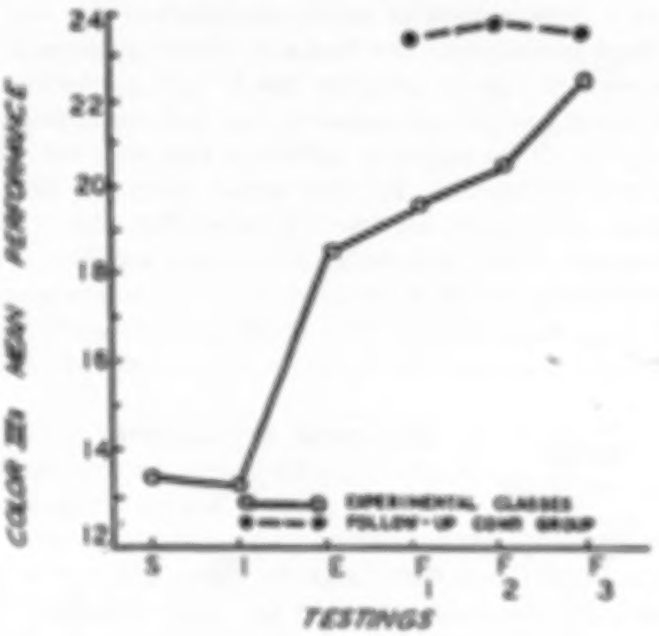


Chart 4 - Mean Changes in Scores on Color Matching Test (Color III) for Experimental and Comparison Subjects, 1958-1961.

The Draw-a-man Test responses were essentially non-productive in a substantial number of cases, but, considered as a whole, did yield some helpful information in relation to pre-school curriculum development. Since this instrument was included as a measure of artistic ability and of the use of expressive media, the limited productivity in itself constituted a useful knowledge for teachers about the subjects and their needs.

Weights. In the Weights Test of discrimination and comprehension there are six items, each of which is scored one point when the correct response is given within the number of trials specified. Considering a score of 5 or 6 as evidence of ability to discriminate and to comprehend directions given, it was found that only 11 per cent of the subjects gave consistent evidence of this skill. In contrast, 38 per cent scored either zero or had only one correct response during the series of from 3 to 5 tests. For the 18 per cent who scored a single correct response, it may be suspected that an element of chance could have accounted for the isolated success. Throughout this series of weight tests there was a high degree of fluctuation in the scores.

Despite the small number of correct responses and the fluctuations among them, the experimental subjects made gains during Project class attendance. (See Table 8.)

Table 8

Comparison of the Mean Point Scores on the Weights Test for Experimental and Comparison Subjects 1958-1961

Experimental Subjects	Maximum No. Points Possible	Mean Number Points Per Child		
		Initial	Exit	Final
1958	6	1.2	2.5	2.9*
1959	6	0.5	0.5	2.1**
1960	6	0.3	2.2	1.4***
1961	6	1.3	0.8	xxx
Comparison Subjects	6	2.3	3.0	3.5

* End of 3 year follow-up
** End of 2 year follow-up
*** End of 1 year follow-up

Analysis of these results showed a statistically significant gain for the 1958 and 1960 groups between admission and exit, while the 1959 class maintained a plateau through exit and then showed similar gain at last follow-up. In contrast, the final results for both 1960 and 1961 were decrements. The comparison subjects not only had mean point scores higher than those for the experimental subjects, but there was also a more consistent gain pattern which was statistically significant. Again, the question of maturation is raised as a possible affective influence upon visual and motor discrimination as well as upon the comprehension of directions required by this test. In addition, a question is posed concerning the minimum expectancy level for competence in each of these areas.

Railwalking. In this single test of motor proficiency, the results were consistently poor and did not lend themselves to analysis. Not only did the experimental group lack the motor skill required, but their apprehension constituted a further deterent to success. Although the test was administered a minimum of three times, the practice did not appear to affect either their confidence or their skill. Since this test was initiated only for use with the pre-school subjects, it was not employed with the in-school comparison subjects nor in the follow-up of experimentals.

The area of specific abilities is one which seems to invite further study from the standpoint of: (1) measurement techniques available for the pre-school retarded and (2) expectancy levels.

Speech and Language Development

In addition to the three taped tests employed by the language developmentalist for continuing diagnostic and planning purposes and which are described in Chapter 4, a battery of three tests was a part of the total Project battery of recorded periodic evaluations. These tests were: Peabody Picture Vocabulary Test, Templin Pre-School Sound Discrimination Test, and Mecham Verbal Language Development Scale. The tabulated results for three testing periods are reported in Appendix C.

For the total experimental subjects the mean change was 2 years-6 months in Vocabulary Age on the Peabody; 1 year-11 months in language age on the Mecham; and 7 points on the Templin. In the same order, the comparison subjects showed gains of 1 year-10 months; 1 year-9 months and 4 points. Since these gross averages represent varied experiences insofar as length of participation is concerned, more comparable analyses have been made.

The first Project year for the 1959, 1960 and 1961 classes have been studied for evidence of progressive changes, and comparisons showed that Peabody and Templin gains were statistically significant at the .001 level and the Mecham at the .01 level, giving tangible evidence of reliable improvement.

Then, combining the 1959 and 1960 classes as having more consistently comparable data from admission through follow-up, analysis of repeated measurements over a three year period gave the following results.

Peabody - gains in vocabulary were consistently reliable both from the standpoint of overall changes and in year to year changes at the .001 level and .01 level respectively.

Mecham - gains in language age showed a similar strong consistency at the .01 level.

Templin - gains in sound discrimination were significant during the experimental class participation at the .01 level, but not during the follow-up period.

In a comparison of the 1958 and 1959 scores of the experimental and comparison subjects, there was no significant difference between gains made by the two groups on the Templin and the Peabody, while the Mecham scores indicated significantly greater gains for the comparison subjects at the .01 level. As a result, while the experimental group does show reliable improvement in these developmental language measures, they do not improve at a faster rate on two of the measures. When the covariance technique was applied to control for age in a comparison of exit to second follow up for the experimentals and the three measurement periods for the comparisons, differences were not statistically significant. If CA is not controlled, the unadjusted mean squares for these differences still would not yield significance.

In a comparison of mean changes for the two subject samples on the basis of socio-economic groups, the lower level for the CRMD group showed a slightly greater increment than did the higher group in all three tests, although this was not a significant difference. For the experimentals, this change was slight for the Mecham only. As in other instances where a similar difference has been found, there is the possibility that the lower group had been functioning more consistently below their potential than had the higher socio-economic subjects.

Social Development

The social development of the study participants as evaluated by the Project Social Development Inventory has been studied and a report of the analysis of these data is given. (See Chapter 4 for additional information about the instruments.) The Social Development Inventory (SDI) was a modification of the Vineland Social Maturity Scale and has employed a "plus" and "minus" scoring procedure. This information was secured during each testing period from both a parent and a teacher for each experimental subject. For the comparison subjects, teacher informants followed this same schedule, but parents were less available and therefore, their reports were less frequent. In order to investigate the two major aspects of these data, namely, (1) the degree of comparability of findings with teachers and parents as informants, and (2) the effects of repeated measurements, analysis was based upon preschool scores for admission, intermediate testing and exit as well as for exit and two sequential follow-ups.

It was found that on an overall basis, parents yielded higher scores than did teachers during the period from admission to exit, but that increments reflected in the teacher reports were not only significant (.01 level) but also more uniform from test period to test period than were those for parents. There was no statistically significant difference between teacher and parent ratings at the exit period, which may reflect a greater mutual understanding by teachers and parents of attainment as a reflection of developmental change. Or, stated differently, as teachers were becoming more knowledgable about their pupils, parents were becoming more realistic. Despite these suppositions, the actual reason for this greater similarity in the reports of the two is not known.

In the analysis of the period from exit (E) through a first and second follow-up (F_1 and F_2) for the experimental subjects, several findings are of interest. The lack of significant difference between parents and teachers at the exit testing period has been established, but more provocative is the fact that there was a significant drop in SDI scores with teachers as informants (.001 level) between exit and first follow-up and between first and second follow-up. A first conclusion could be that children moving from the preschool program into a different school environment may have regressed socially. Other possibilities, equally strong, would appear to be that the new teacher informants were less familiar with the children or that they had higher expectations and were downgrading on the basis of their expectations. In contrast, parent scores showed continuing gains in social development for these same test periods (Means E = 57.73, F_1 = 62.38 and F_2 = 64.44). Considering these ratings in relation to those by teachers, there is the possibility that the continuity of parent ratings better reflects the actual level of child development. It is true, also, that parents may have been using an entirely different frame of reference than that which constituted the basis for teacher expectations. Still another possible explanation is that parents may have been unrealistic in their ratings, and, because they wanted so much to see certain things taking place, they perceived them as accomplishments. Regardless of the reason, the differences between parent and teacher ratings in the latter test periods did exist.

In order to determine the degree of confidence to be given the scores yielded by the SDI, the stability of the measure has been investigated. Test-retest correlation (scores for a test period compared with scores the following year) were given for the tests on admission (A), intermediate (I), exit (E), first follow-up (F_1) and second follow-up (F_2) and based upon both parent and teacher reports. The results were as follows:

Table 9

Test-Retest Correlations for Sequential Periods on Teacher and Parents Social Development Inventory Scores

Periods Correlated	N	SDI Teacher Correlations	N	SDI Parent Correlations
A - I	35	.67*	36	.73*
I - E	46	.29**	45	.31**
E - F_1	35	.34**	41	.49*
F_1 - F_2	20	.74*	21	.44**

*$p < .01$ **$p < .05$

Admittedly, the stability of the Project Social Development Inventory on the basis of this sample affords a consistently strong measure of confidence only for the A - I period. It should be noted, however, that the limits imposed on the range of possible scores have been restricted by the nature of this sample. Considering this, there is a reasonable possibility that these correlations may be underestimates insofar as consistency is concerned. Since SDI correlations for both parents and teachers show a marked drop during the second year (I - E period), attention is invited to the possible meaning of this deviation. It is conceivable that this drop is a function of the instrument, but it is also plausible that these preschool children evidenced an irregular pattern in social development, thereby accounting to some extent, for the low correlations. A final and important point here concerns the long time period between testings, and, because of this, the differences found may well be real, i.e., actual changes in pupils rather than possible error variances in the instruments. For this reason, the correlations have been considered as indications of the level of stability of the measure and not as a determination of its reliability.

Turning attention to the CRMD Comparison subjects, analysis was made to compare two year (initial and final) differences for these subjects with differences for the experimental subjects from exit to second follow-up. (Covariance was applied to control age differences.) The comparison at the first follow-up period has a particular interest since the experimental children were being rated for the first time by public school teachers to whom these were new pupils, while the CRMD pupils had been enrolled in these classes at the time of selection for the Project and may be assumed to be familiar to the teachers. With this knowledge, it is not surprising that the increment for the comparison groups was significantly greater (at .01 level for two year difference and .05 at first follow-up period) than for the experimental subjects.

Examination by t-test of F_1 differences between parent ratings for the CRMD and for the experimental subjects resulted in a statistically reliable difference at the .001 level. For the experimental group, the mean parent SDI was 61.15 at the F_1 period and for the comparison group parents, a mean of 66.77. As with the teacher ratings, these may be valid appraisals allied to the differences among the children. On the other hand these may be reflections of differences within the two parent populations which are better explained by the social data. The fact remains that the difference is significant; the cause for it is not readily discernible.

As with the experimental subjects, correlations were computed for the CRMD comparison group between teacher and parent scores for the F_1 period, and this correlation was .32. In the investigation of test-retest evidence of stability for teachers between testings F_1 - F_2 and F_2 - F_3, the correlations were .66 and .63 respectively, similar to those for the experimental subjects.

Pupil Growth and Achievements

In order to give needed perspective to the total evaluative process in which the Project subjects were involved, namely, the goals of studying the effects of the structured preschool curriculum upon individual learning and adjustment and upon later adaptation and achievement, measurable gains in the experimental program and achievements after leading the Project have been investigated. Analysis of the data derived from two measures, the Developmental Curriculum Scale and the Wide Range Achievement Tests, has proceeded somewhat differently because of the nature of the instruments and the extent of the availability of scores. The curriculum scale was developed during the initial pilot year of the Study and was employed for the first time with the 1959 older experimental class for two testing periods. After this it was used three times each year for all experimental subjects. The Wide Range was administered after all experimental subjects had transferred from the Project classes in the Fall of 1961 as well as to a group of their peers enrolled in the same classes.

Developmental Curriculum Scale (DCS). Seven sub-scales are included in the DCS covering the major aspects of the curriculum, namely, A. Self Help, B. Social Development, C. Emotional Development, D. Creative Expression and Imagination, E. Manipulative Development, F. Motor Development, G. Intellectual Growth. Each sub-scale has a 5-point rating basis for each cluster of items included in it. The investigation of these data has included analyses of (1) each sub-scale, (2) overall change, and (3) the reliability of the DCS as an objective rating scale.

(1) Analyses of sub-scale ratings. After computing the scores on subscales A through G by determining the mean ratings for each, the means were used in a repeated ratings-subject analysis to determine the differences between ratings for each given period. Only 1960 and 1961 experimental classes were used because they had the complete three ratings each year, while the 1959 class had only two. The results were that overall growth in each DCS sub-scale was highly reliable at or beyond the .01 level of significance. Further, this growth proved to be statistically significant from one rating period to the next with few exceptions. The extent of this significance is given in Table 10.

Table 10
Effects of Repeated Ratings on Developmental Curriculum Scale.
Sub-Scales for Experimental Subjects in the 1960 and 1961 classes
(based upon Mean Ratings for items in each sub-scale)^{FN}

	Differences of Mean Ratings between Periods						
Period Compared†	A. Self Help	B. Social Development	C. Emotional Development	D. Imagination, Creative Expression	E. Manipulative Development	F. Motor Development	G. Intellectual Development
Initial-January$_1$	.84**	.65**	.81**	.56**	.63**	.49**	.55**
January$_1$ -June$_1$	.43*	.46**	.33	.55**	.58**	.46**	.48**
June$_1$ -September	.38*	.40**	.52*	.16	.29*	.35**	.59**
September-January$_2$	.21	.23	.54*	.52**	.36**	.34**	.33*
January$_2$ -June$_2$	.21	.61**	.57**	.70**	.46**	.18	.41*

**p<.01 *p<.05

†The periods being compared cover two school years for each of two classes, namely, 1960 and 1961, combined.

^{FN}Mean Ratings for cluster of items in each sub-scale above:

Mean Ratings

Rating Period	A	B	C	D	E	F	G
Initial	2.62	2.17	2.21	2.08	2.11	2.44	2.13
January$_1$	3.46	2.82	3.02	2.64	2.74	2.93	2.68
June$_1$	3.89	3.28	3.35	3.19	3.32	3.39	3.16
September	4.27	3.68	3.87	3.35	3.61	3.74	3.75
January$_2$	4.48	3.91	4.41	3.87	3.97	4.08	4.08
June$_2$	4.69	4.52	4.98	4.57	4.43	4.26	4.49

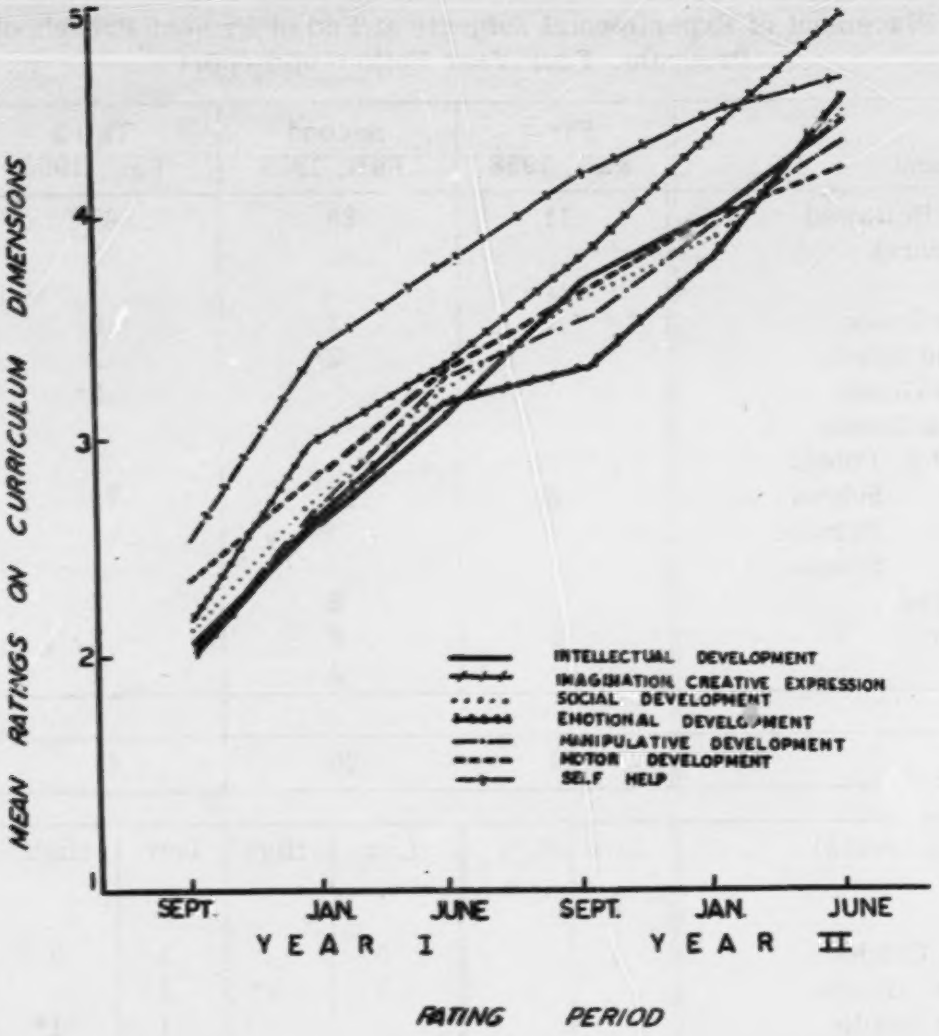


Chart 5 - Mean Ratings for Each of the Seven Sub-Scales of the Developmental Curriculum Scale for the 1960 and 1961 Experimental Subjects for Six Sequential Rating Periods 1959-1961.

Total DCS Mean Rating. The overall growth of the subjects collectively was such that their scores approximately doubled during this period. During this two year period in which the subject measurable growth showed such substantial gain, their mean I.Q. gain was 8.2 points for a mean I.Q. of 69.3. Although the DCS has not yet been proven as a measurement instrument, there are indications that the growth shown is stable. Supporting evidence is found in the fact that overall rated growth attained in June was dissipated little during the intervening summer prior to the rating in September. It is particularly interesting to note the growth that occurred in intellectual development over the summer.

Greatest gain was shown in Emotional Development, second highest in Imagination and Creative Expression, for each of which it can be seen that the distribution curve approximates a straight line (chart 5). For the areas of least gain, Self Help and Motor Development, the graph has appeared to reflect adequately the nature of the growth observed. In the former, the mastery of needed skills approached a plateau near the upper limits of the scale, while the latter described a similar curve which was necessarily influenced by the presence of motor handicaps in addition to limitations imposed by the level of maturation. In each of the sub-scale areas, the most encouraging outcome has been the evolving potential for growth and learning despite the slower rate of growth.

DCS Rating Reliability. Because these children moved from one Project teacher to another at the beginning of the second year, it was possible to estimate the stability of the scale as well as its objectivity by correlating the total mean rating for the first June period (June$_1$) with the following September, each made by a different teacher. This correlation was .84, which would appear to support adequately the objectivity of the instrument tested.

Pupil Placements at End of Project Class Participation. In Table 11 the placement of each child

Table 11

Placement of Experimental Subjects at End of Project Preschool Program: Four Year Follow-up Report

Type Placement	First Fall, 1958	Second Fall, 1959	Third Fall, 1960	Fourth Fall, 1961
Total Number Pupils Followed (Summary Report)	11	26	41	54
Kindergarten	1			
Regular Class: First Grade	1	3	6	
Second Grade		2*	2	4
Third Grade			2*	2
Fourth Grade				2*
Special Class for M.R.: Public School	8	15	23	33
Private School			1	1
Other type special class		2	3	4
Residential institution	1	2	2	2
At Home		2	2	3
Placement not known				3**
Totals	11	26	41	54

(by socio-economic levels)	Low	High	Low	High	Low	High	Low	High
Kindergarten	1							
Regular class: First Grade	1		3		3	3		
Second Grade			1	1*	2		2	2
Third Grade					1	1*	2	
Fourth Grade							1	1
Special class for M.R.: Public School	5	3	8	7	12	11	18	15
Private School					1		1	
Other types special class			1	1	2	1	2	2
Residential Institution	1		2		2		2	
At Home			1	1	1	1	2	1
Placement not known							3**	
Totals	8	3	16	10	24	17	33	21

* One moved to Vermont and placement known.

** Placements not known for 3 who moved away: 1 to Puerto Rico, 1 to Maryland, 1 no information.

who had participated in the experimental classes is shown. This report is cumulative for the years 1958-1961. It will be noted that in the fall of 1961, approximately 63 per cent of the experimental children were in public or private special classes for the mentally retarded, while the remainder who could be located were in a diversity of classes, 15 per cent in regular classes, 8 per cent in other types of special schools or programs and 4 per cent had been institutionalized. Only 3 children (5 per cent) were not in school programs, two of whom were reported to be temporarily at home. Measurable intellectual gains and, to some extent, the adjustments made appear to be reflected in the achievements shown during the final 1961 follow-up.

Wide Range Achievement Tests. During the 1961 Fall semester, 39 Project experimental subjects were administered Wide Range Achievement Tests; 7 were from the 1958 class, 10 from

1959, 12 from 1960 and 10 from the 1961 group. Their placement distribution was: 26 in public school classes for the educable mentally retarded, 3 in trainable programs, 6 in regular second grades, and 4 in several other types of special classes. The Wide Range was administered also to an equal number of classroom peers in these same classes, matched for sex and age.

The tabulated data in Appendix C offers an overview of individual measurable growth as well as an opportunity for the reader to study as extensively as he wishes any possible influences which might be suggested by socio-economic conditions, race or sex, and to view these results in relation to other findings similarly included.

The overall mean I.Q. for the experimental subjects was 62.52, with a range from 35 to 89. The total peer group mean I.Q. was 65.73 with the spread being 29 to 108. This difference between the I.Q. means was not statistically significant. The mean age for the total experimental subjects was 106.87 months, for the peer group, 107.23 months. In the comparison of former Project subjects and the peer control group, results for the three Wide Range sub-tests were: Reading, significant at the .05 level; Spelling and Arithmetic not significant.

Although the two groups were not significantly different in spelling and arithmetic, the reading scores for the experimentals were substantially higher, showing an increment approximately 5 months greater than for the peers. This finding is not inconsistent with the preschool curriculum emphasis upon reading readiness with less concentrated attention given to arithmetic computation and still less to spelling. Further, a majority of these former experimental subjects as well as their peer control group were in special classes for the retarded, where spelling and arithmetic would not be major emphases, particularly at the primary level.

Some additional support to the greater preschool effort in the area of reading may be afforded by considering the relative strengths of the achievements made by the experimental group in the three academic areas tested. Comparing achievements for reading and spelling and for reading and arithmetic, reading gains were consistently statistically significant, for the former at the .001 level and for the latter, .05. In contrast, the peer group comparison in achievements did not result in any statistically significant differences for the three areas.

Achievement for regular class placements. In the case of the six experimental subjects in regular classes, the curriculum and the competition were somewhat different. The Project subject group mean age was 102.0 months, the peer mean 99.33 months; the mean I.Q.'s 77.20 (range 69-89) and 87.67 (range 81-108) respectively, not a statistically significant difference. Here, however, it might be expected that the peer group could have a small advantage from the standpoint of intellectual capability which might not be compensated by the pre-school orientation of the subject group. A comparison of their Wide Range achievements resulted in the experimental subjects being significantly superior in the spelling test while showing no difference in the area of arithmetic. In reading, the peer group mean performance was precisely at the second grade level, while the performance of the experimentals was a mean of 2.97, or essentially third grade reading level. Although this reading difference did not prove to be statistically significant, the achievement gains were in favor of the experimental subjects. However, in view of the small numbers in the sample, cross validation is needed.

On the basis of these analyses of findings, it is generally concluded that the preschool experimental curriculum has appeared to provide a good start in reading for those children who participated in it. With regard to all seven major areas of the pre-school curriculum, the results obtained by the Developmental Curriculum Scale indicate that the children in the experimental program made substantial measurable gains and there is considerable support for the conviction that these gains were reliable.

If one combines the academic advantage shown with the increased social adjustment and group adaptation previously discussed, it would appear that the pre-school program reported can offer a valuable help to similarly handicapped mentally retarded children. While such a program does not compensate for the limitations imposed by the disability, there is support for the assumption that early structured training in the development of the intellectual capabilities present, together with improved speech and language, greater social adaptibility and personal stabilization, can facilitate personal and group effectiveness, laying the foundation for substantially greater benefits from later special training.

II. REPORT ON RELATED FINDINGS

In addition to those aspects of the study which lent themselves to statistical analyses or were expected to do so, there were other areas of investigation that yielded substantial information for which only a descriptive report can be made. In each instance, the findings in this section are directly related to the previously reported evaluative data collected for subjects while at the same time being intimately associated with program evaluation.

Classroom Observations

It has been stated that one method of studying the needs of children as they relate to curriculum development was the use of recorded observations. Among the earlier techniques experimented with in this Project were observations of: (1) groups of children engaged in specific activities, such as, music, art, juice time, trips to the park, quiet time, story time, free play and others and (2) group reaction to the environment, extent and ways of socialization, emotional reactions, including those to both frustration and routine. These goals were achieved through observations for timed short intervals and for extended periods. In addition, there was concentrated attention to individual child study, and here observations also were recorded using both timed and continuing records. Sequential observations of each child were made over a period of from three to nine months covering motility, critical incidents and types of contacts, those self-initiated and those initiated by others.

Because of the problems incurred by attempts to record all of the detail observed in the classroom or in a group activity, a series of material and activity charts were constructed (see Appendix B), as well as an orderly check list of developmental activities, motor skills and social behavior. The latter tool afforded a great deal of precise data in chronological sequence, but had the limitation commonly found in other check lists in that it emphasized the parts rather than the whole and, at times, failed to describe adequately integrated change and growth. To an appreciable extent, however, the limitations were alleviated, though not entirely compensated, by the reports of ancillary staff in medicine, nursing, psychology, language development and social work, as well as by the regular cab drivers, all of whose reports were made a part of the pupil records. Despite the values obtained from this variety of observation, none seemed to satisfy the full benefits anticipated for observations in building a curriculum.

Following use of these varied approaches during the first two years of the Study, the check lists, itemized reports, and, in fact, all quantitative techniques were discontinued, and a detailed descriptive taped record was made by the observers. Notations concerning time intervals were freely made, and these added further clarity. This observational technique provided not only extensive information about children as a group and individual children in a group situation, but it also contributed knowledge in other areas of concern to the Mental Retardation Project.

With the use of taped reports, it was possible to study more easily teacher-pupil and teacher-teacher interactions. Throughout every aspect of the program, the teacher-pupil relationship was recorded, affording a clearer understanding of communications, levels of acceptance, initiation of contacts, situational developments, and the ego needs of both teacher and child. In the area of teacher-teacher relations and interaction, the tapes were able to depict more adequately the extent of observed coordination and the transition from one activity to another, as well as the frequency of both overt and more subtle types of spontaneous communication between the adults in the classroom.

In short, the process of experimenting with several techniques of observation and then eliminating those of less value was able to identify one method which had greater productivity than the rest. This determination of the superiority of the taped report of total observations does not deny that each technique used contributed in some measure to curriculum development. The tapes, however, focused for longer periods of time upon the total group in its environment, giving a running description of what was happening, while at the same time pointing out individual children, the extent and nature of their participation in a given activity or their withdrawal from it, and the role of the teachers and other adults in the total happenings. A further advantage both to teachers and consultants was the ability to see the objective report of the observer in comparison with the more subjective teacher accounts for any given day.

For example:

> Observer: First car of children arrives:
> ". . . After all the children have their wraps off, Teacher sends them to the table to sit down. . . When they sit down, Teacher says, "We have a birthday to talk about today." As the children gather around the table, Teacher comes over with the Parent Reports. . . She makes sure everyone gets some pretzels and then hands out the reports. . . to each child to take home to his parents. . . The main activity is sitting at the table looking at the Newsletter and eating pretzels. Teacher is talking with the children, commenting about one thing and another as they wait for the second car."
>
> Teacher Log:
> " . . . the early arrivals removed wraps, settled at the tables, and listened to the story

of the swimming pictures before the others arrived." (Were the swimming pictures in the Newsletter?)

Another instance of the same type was:

Observer:
"Teacher says, "we have many things to do today. Shall I tell you?" (Then, they are enumerated by the Teacher.)

Teacher Log:
"Following the newsreading, the children were asked what they thought they would do today. (This is the first direct attempt at child-planning of activities.)"

Such examples as these have not be construed as intentionally incomplete or contradictory reporting, but rather that the observer narrated what he saw, while the teacher, knowing his plans and intended development of them, in retrospect, saw them as accomplishments rather than as plans. In the first example, the continuity observed was not clear and the development of the activities appeared confusing in the brevity of the notes made by the teacher. Therefore, they afford limited value as a reference in program development. To be able to see these reports in writing afforded a more objective aid to the teacher and gave some helpful guides to those responsible for curriculum in strengthening program and in giving pertinent consultant services to teachers.

On the other hand, the extent to which a plan was successfully carried through could be supported by the clarity of the observer's report of an activity.

Examples of these are:

Observer:
Children are sitting around two tables and Teacher "brings over pictures she has made of a cake with candles. She gives one to each child. These are apparently going to be placemats for the party. Teacher holds up a picture to give them ideas of how to make the mats. . . She goes around and helps each child with his coloring. At 2:14 Teacher begins to gather up the cakes and candles and puts the children's names on them."

Teacher Log:
Children went to wash their hands. . . "and returned quickly to make the placemats. Papers with a cake drawn on them were ready, together with red and blue crayons for making holders and candles to match the model." Teacher then describes the children working on their projects.

Observer:
At 1:57 p.m. the children finished their game and Teacher had them go back to the table. She brought out a turkey made with a large piece of cardboard. She showed that the pieces were loose and explained that they would paste them together. She distributed the turkey parts and paste to each child and then walked around and gave individual help. Then she collected all the pieces and the children watched as she fastened them together. By 2:19 p.m. the children were running out to wash their hands, and, as they washed, Teacher sent them back into the room with individual suggestions for activities for the free-play period. (Shows transition from action game, to pasting, to wash up, to free-play).

Teacher Log:
Teacher reports that children gather around table; materials are distributed and pasting gets under way with teacher help for individual children as it is needed. The Teacher reports the cleanup activity that follow: and how children returning to the room enter into various types of free-play. (The Teacher did not include the assembling of the turkeys, but did give more detail about the coordination and work characteristics of individual children.)

As can be seen, each of the latter reports reinforces the other, both in the description of a single activity and in showing the transition from one activity to another. In such examples, there is support to the thought that teacher planning and program implementation have been clearly coordinated.

Related to the concept that observations could implement program development was the aid they offered in evaluating the need for group and individual controls, for more objectively seeing when freedom appeared to contribute to the development of initiation and self direction, and when it appeared to stimulate hyperactivity and disruption of purposeful activity in the group. Often, too, the extent of participation in a given activity by all or a majority of children is not seen in the same way by the teacher involved as by the observer who is removed from the classroom environment. Through the reports of the observer, the child or children who withdrew frequently or for long periods was detected very easily by the teacher to whom this awareness was important.

As a result of the specific emphases of the observations, including behavior reflected in motor and manipulative ability, language, conceptualization and reaction to environment, a concerted attention was given to the social interaction of the children. In furthering this latter named aspect of the study, twice a week there was experimentation in developing a sociometric technique which would depict this group interaction. Underlying the technique used was the theory that by counting the number of social contacts, both those self-initiated and those initiated by others, it would be possible to obtain a general picture of the social interaction of the group. This quantitative account, as a supplement to the qualitative narrative reports, was thought to offer a more reliable picture than either one alone. As a further quantitative study, the social interaction of the mentally retarded group was compared with that of a normal group of children with similar chronological ages. The findings of this investigation together with conclusions drawn from them are reported in Appendix B.

Throughout the three years during which experimentation with observations was ongoing there was an increasing consideration given to the personal and professional qualifications needed by observers. Early it was found necessary to have the observers removed from intimate contact with the curriculum development as well as from the classroom staff, in order to achieve as great a degree of objectivity as possible. This decision served to define one essential requirement, the ability to work essentially alone and without the support of team interaction. In addition to this, observers needed skill in handling details and in adjusting to prolonged concentration of attention while being physically inactive. Those found suitable for this work were perceptive, extremely alert, able to translate the action seen into clear concise sentences while, at the same time, observing new and different developments. They needed to understand psychological principles in operation and to be cognizant of teaching skills and teacher planning. The role of the observer was a difficult one, and the clarity of the reports obtained attests to the competence which was developed during the progress of this phase of the Study.

Throughout the use of observations in the Mental Retardation Project, the single concern for their productivity was in relation to curriculum development. A technique was successful or not according to the value of the obtained information in building the curriculum. As a result, reports of observations were studied from the standpoint of the degree of their benefit in this defined area, and no attempt was made to investigate these findings or to study the techniques in relation to their possible full import in therapeutic situations, psychological and sociological studies, or broad aspects of general teacher preparation. An awareness, however, of these broader uses of the data compiled has been present, and it is anticipated that further analysis of it will be made at a later time.

Parent Attitudes

In an effort to determine the extent to which a positive correlation existed between parent attitudes toward the mentally retarded child and progress of the child in learning and in adjustments, an attitudinal study was made. As previously reported, this phase of the investigation was based upon periodic structured interviews, and active parent participation in the Project was one of the agreements made at the time the child was admitted to a class. Three parent interviews were held in fulfillment of this phase of the study: (1) an intake interview with both parents, where both were available; (2) an end of the year interview; and (3) a follow-up interview when the child had completed his Project class program. The results from these series of inquiries constitute the basis for determining the parent attitudes toward the Project subjects.

Parent Intake Interviews.

The initial parent views and attitudes were considered under five broad and related categories, namely, (1) causes of mental retardation; (2) recognition of this condition in their own child together with possible causative factors; (3) reaction to the child as a person; (4) the concern they feel for their child and his future; and (5) their reactions to and expectations from a special class placement. The findings obtained are reported in the above order.

1. Causes of mental retardation. Responses indicating the extent of parent understanding of the causes of mental retardation, were classified under five items:

	Parent Responses	
	No. Mothers	No. Fathers
Medical explanation	12	7
Own theory-unconfirmed	9	6
Child not recognized as different	5	3
Neglect (not by respondent)	3	-
No classifiable response	25	34
Totals	54	50

Roughly one-third of the parents, 22 per cent of the mothers and 14 per cent of the fathers, gave indications of a factual understanding of the true nature of mental retardation, while at the other extreme, 7 per cent of the total responses denied any difference in their child, thereby creating a possible emotional block to gaining understanding. Well over 50 per cent fall between the two extremes noted.

2. Recognition of mental retardation. Pursuing the verbalized understanding of the condition of mental retardation with a more specific question concerning the extent to which retardation was recognized in the parents' own child, the following replies were given:

	Parent Responses	
	No. Mothers	No. Fathers
Child retarded in every way	14	12
Retarded in intellectual, motor, speech areas	15	7
Not retarded, but slow in learning or speech	18	17
Not retarded, slow in reading and writing	1	-
Not different in any way	3	2
No classifiable response	3	12
Totals	54	50

Here, the child is defended as not different in any way by less than 5 per cent of the parents, while the number who describe their children as slow, but not retarded, constitute 35 per cent. This would mean that nearly 40 per cent of the parents, roughly 2 in 5, indicated a lack of recognition of retardation in their own child and raised a strong possibility that there actually was limited understanding of the condition of mental retardation itself or, if understanding was present, there was not the ability to acknowledge the condition verbally.

When parent attention was directed to consider any differences noted between this child and others, there was another shift in the categorical denial of differences. These denials slightly exceeded 10 per cent of the responses. The total replies were:

	No. Combined* Parent Responses
Never noticed any difference	6
Noticed prior to 1 year of age	19
Noticed between 1 and 3 years	23
Noticed between 3 and 5 years	2
Noticed between 5 and 6 years	1
Not sure when difference noticed	1
Noticed at time of school entrance	1
Total	54

*When the replies given by both parents were the same, they have been treated as one.

While the time at which any difference was noted varied widely, 90 per cent of the parents admitted that this child was different in some way from others, although this does not suggest that 90 per cent either recognized or accepted mental retardation as a cause. The agreement shown by both parents of each child is another interesting reaction.

Additional clarification of the character of the differences noticed was given by parents in response to questions concerning the nature of this slowness as well as any explanation which they had for the child's being slow. These responses were:

First Indication of Slowness	No. Combined Parent Responses
Sitting up	13
Walking	16
Toilet training	2
Talking	11
Appearance (including at birth)	10
School suggested	1
Not sure	1
Total	54

Reason for Slowness	No. Combined Parent Responses
Family trait	5
Prematurity	2
Birth injury-neurological	4
Illness in infancy	3
Emotional problem	3
Neglect	2
Complexity of causes	6
No explanation	29
Total	54

It will be seen here that all parents indicated that slowness had been observed and slightly more than 45 per cent suggested a reason for this less rapid development. When dealing specifically with characteristics of early development and the generally accepted expectancy level in this area of growth, parent concerns have appeared to dominate their cautious defense of their offspring, and the problems begin to find expression.

3. The Child as a Person. After investigating the parent attitude toward mental retardation as an entity and his attitude toward mental retardation in relation to his own child, an effort was made by the interviewer to determine the parents reaction to his child as a person. A 4-point scale was used with the following results:

	Severely critical (no positive comments)	Moderately critical (balance of + and - comment)	Not critical (essentially positive)	Unable to determine
Mother	3	17	34	0
Father	1	6	27	16

This tabulation shows that a fourth of the parents were moderately or severely critical of the child, while 60 per cent were uncritical during the interview. Mothers tended to be more critical than fathers by a ratio of 3:1. In fact, roughly a third of the fathers succeeded in masking their reactions to such a degree that the interviewer was unable to determine what they were, but, in contrast, no mothers did so.

4. The child and his future. Recognizing that parent concerns and worries for mentally retarded children generally are projected into the future even more than they are allied with the present, several questions were posed to elicit these reactions. The results of the inquiry concerning parents' major concerns is given in rank order in Table 12 in the column marked "Initial" interview. These responses, however, do not take cognizance of the fact that, for a limited 3.5 per cent of the mothers and a substantial 38 per cent of the fathers, no specific concern was verbalized, although no denial of concerns was made. To the extent that responses were obtained, the concerns of both parents for their child tended to parallel one another, with speech, intellectual development and social adjustment, in that order, being of prime importance.

When they considered the extent to which the child could learn the parents concurred in the following appraisal:

Child's Learning Capability	No. Combined Parent Responses
To talk, read and write	24
To talk, read, write, and go to school	1
To talk, read, write, go to school and hold job	14
To talk, read, write, hold a job	6
To hold a job	3
Parents not sure	6
Total	54

Over 40 per cent anticipated that the child would learn to talk, to read and to write, but consistently did not include attending school as a part of this learning. In addition, roughly 10 per cent more anticipated holding a job, while still being very vague about school attendance. A question has been raised here as to whether the general concept of school as regular classes for normal children might not have constituted a block in parent thinking, and, as a result, they may have simply

Table 12

Major Concerns Expressed by Parents About Their Mentally Retarded Children Participating in the Experimental Pre-school Program

Part 1.

Major Concerns	Rank Order of Major Concerns Expressed by Total Parent Group Initial	End of Year	Follow-up
Speech Development	1	9	3
Intellectual Development	2	4	1
Social Adjustment	3	1	2
Strength and Coordination	5	8	4
Discipline, behavior	6	6.5	6.5
Health	4	6.5	5
Emotional adjustment		3	
Sex problems (incl. masturbation)	7	2	6.5
Care of personal needs		5	
Delinquency	8		8

Table 12 (Continued)

Part 2.

Rank Order of Major Concerns of Parents according to Socio-Economic Status

Major Concerns	Lower Socio-Economic Group			Higher Socio-Economic Group		
	Initial	End of Year	Follow-up	Initial	End of Year	Follow-up
Speech Development	1	7	2.5	1	8.5	3
Intellectual Development	2	3	1	2	5.5	1
Social Adjustments	3	1	2.5	3	2	2
Strength and Coordination	6	8.5	4.5	4	5.5	4
Discipline, behavior	5	6	6	6.5	7	
Health	4	8.5	4.5	5	3.5	5
Emotional Adjustment		4			3.5	
Sex problems (incl. masturbation)	7	2	7	8	1	6
Care of personal needs		5		6.5	8.5	
Delinquency	8		8	9		

avoided it. A related possibility may be that a special class was considered to be the means for accomplishing reading and writing, while "going to school" meant regular classes. The tremendous concern about speech and the ability to read and write is reflected in the consistency with which the majority of parents emphasized these skills as anticipated goals. As an ancillary reflection of the degree of normalcy to which these parents held, 32 per cent specified their belief that one day their children would be independent and married.

5. Special Class Placement. Since these children were being admitted to the special Project classes, inquiries were made to determine the parent reactions to a special class placement and the expectations they had for such an experience. The findings were the following:

Parent Reaction to Special Class Placement	Parent Responses	
	No. Mothers	No. Fathers
Accepts it as an urgent need	8	7
Accepts, but no urgency	26	19
Ambivalent	11	7
Does not like idea	3	2
Rejects idea	6	4
Reaction not clear	-	11
Totals	54	50

Parent General Expectations from Special Class Placement	Parent Responses	
	No. Mothers	No. Fathers
Preparation for regular class and normalcy	16	9
Social experience, including speech	33	24
Learning to read and write	-	-
Not sure	3	16
Nothing	2	1
Totals	54	50

Parent Long Range Educational Expectations	Parent Responses	
	No. Mothers	No. Fathers
Child will never learn	-	-
Child capable of minimal learning only	13	12
Child capable of regular class, but will be slower	15	7
Child capable of high school and college, if he wishes	9	7
Not sure	17	24
Totals	54	50

At the time of enrollment in the Project classes, approximately 14 per cent of the parents did not like the idea of a special class placement, with some actually rejecting it as unnecessary. About an equal number regarded it as an urgent need. Between these extremes, a preponderance, 43 per cent, accepted the placement without considering it imperative.

Despite the fact that a number of parents rejected the idea of a special class for their children, and an almost equal number expressed no clear reaction to it, almost consistently the parents (97 per cent) expected some gains for their children in the program. About 55 per cent expressed conservative expectations for social experience and speech improvement, with almost one-fourth regarding the classes hopefully as a transition toward normalcy, and the balance, not sure what to expect, anticipated growth and positive gains. In the case of those anticipating normalcy, perhaps the earlier avoidance of attending school as a goal is partially clarified, for normalcy and school are being considered together rather than as separate objectives.

Educationally, from the standpoint of academic achievement, a larger number of parents, 40 per cent, were less sure of what to expect in the future, while a substantial 24 per cent felt the learning achievement would be minimal. The rest of the parents felt this experience would lead to regular classes, although the child might progress more slowly, or even to high school and college. The extent to which the last named expectation represented conviction or wishful thinking is not known.

Throughout the initial parent reactions studied there was a consistent pattern of much greater verbalized optimism and higher expectations on the part of mothers than of fathers, with the fathers exercising caution in committing themselves to definite reactions or attitudes. It was also true that the attitudes and expectancies of the mother and father of a child frequently were extremely different. This would appear to support the idea that total family relations were affected by a retarded child and the resulting tensions in the family are an integral concern in working with both child and family. Insofar as noticeable overt evidences of tension were observed in this group, 57 per cent of the parents evidenced levels of tension ranging from a serious degree to that characterized by reasonable controls. Only about 23 per cent gave a continuing picture of relative ease and mutual understanding.

Parent End-of-Year Interviews.

Upon the completion of a year in a Project experimental class the second parent interview was held, designed to appraise the attitudes of parents toward this experience, toward the child and his disability. The results of this inquiry were that 93 per cent indicated there had been a change in the child's behavior; 69 per cent considered the change to be an improvement and 22 per cent thought it had included both improvement and some negative aspects. Only 1 per cent thought the child's total behavior was worse while approximately 7 per cent were undecided about the changes which had occurred.

The ways in which parents thought behavior to be better or worse are given below in rank order:

Behavior Better

Category of Change	Rank Order of Response
Speech	1
Social behavior with children	3
Easier for parents to handle	4
More self help	2
More helpful with chores	6
Motor coordination	5

Behavior Worse

Category of Change	Rank Order of Response
Imitates associates' mannerisms	4
More aggressive with children	1
More disobedient	2
More hyperactive	3

At the end of the year parent attitudes toward the program also appeared to be essentially positive, which may have been directly related to the fact that speech had been a primary area of concern and now was reported to be the area of greatest improvement. A total of 91 per cent of the parents stated that talking had definitely improved and 7 per cent were not sure but knew it was not worse. The concerted attention given to self help in the experimental program also is reflected in the improvements noted. In contrast, it is not surprising that a years' experience with their peers in a pre-school setting had resulted in more aggressiveness, nor that they were imitating some of the child mannerisms they observed. Also, there was a strong 96 per cent of parents who reported greater independence of the child, and, paralleling the greater independence, was the parent reports of disobedience. There is some evidence here that child growth and learning were taking place and that parents were aware of the gains.

The verbalized concern about aggressiveness was a newly expressed facet of parents reaction and this was investigated.

Parents Reaction to Aggressive Behavior	No. Combined Parent Responses
Punish child	7
Expect it as step toward improvement	16
Not sure about reaction	30
Did not respond	1

Perhaps the more pertinent conclusion which may be derived from these responses is that a substantial percentage of parents did not have a clearly defined reaction to this new pattern of child behavior. The fact that 25 per cent saw it as a step towards improvement can be considered to be a perceptive attitudinal reaction, which need not preclude the probability that controls were also invoked here as well as by parents who simply reported that they "punish child."

There had been a shift, too, in the emphasis given to major parent concerns. (See Table 12, columns marked "End of Year.") Here it is noted that speech has dropped dramatically to eighth place and social adjustment has pre-empted the first concern position. Health has been slightly raised in importance, while intellectual development has dropped. A new importance is given to emotional stability and also to sex problems, both no doubt a product of less seclusion and more opportunity for group interaction with other children. Among fathers there is a growing trend in the importance given to intellectual growth, and, with both parents, attention to the ability to care for physical needs is increasing as additional self care skills are added. The verbalized concerns of mothers here have been slightly less intense, but the ability of fathers to express their reactions has increased.

Follow-up Parent Interviews.

When the youngsters who had completed the experimental program were followed up by the social worker, the parent interviews showed another shift with regard to major concerns. (See Table 12 columns designated as "Follow-up.") This change appears to reflect the school transition then taking place, with parental attention being turned to new school adjustments in progress and anticipated. In view of the strong preference expressed for enrollment in public schools, a renewed priority was given to the importance of academic achievement and intellectual development. At this time, social adjustment and speech were relegated to second and third rank concerns. With larger schools and less extensive supervision in a less protective environment, strength and coordination, too, have been elevated to greater importance.

Throughout these interviews, there have been clearly identifiable positive trends which cannot be statistically confirmed, but are significant nonetheless. One has been the increased verbalization by parents of their reactions and concerns about their mentally retarded children, and with this have come other changes. Among these changes are: greater knowledge of the nature of the disability, increased understanding and acceptance of the child with the handicap, a growing ability to replace unrealistic goals with more appropriate ones, a resulting increased relaxation both with the child and in the family. Every parent did not show every one of these constructive changes, but a majority of the parents did give evidence of these reactions.

CHAPTER 6

RESULTS OF THE STUDY: THE EXPERIMENTAL PRESCHOOL CURRICULUM

A major commitment of the Mental Retardation Project was the development of curriculum materials and educational methodology for use by teachers of educable mentally retarded children whose chronological ages are five through seven years. The report summarized here and presented in detail in Volume II describes the curriculum rationale, the setting and process for its development, the Curriculum Guide and its use, the action settings for program implementation, the programming of the Curriculum Guide, and the evaluation by teachers. Based on observed sequences of child behavior and the direction of the learning taking place, the Curriculum is the one prepared and used by teachers in the experimental classes. The Guide, which was developed during the first year, served as a basis for activity planning and evaluation for the remaining three years of the Study.

Curriculum Rationale

Children who are referred as mentally retarded at four or five years of age have, by their very identification at this age, experienced considerable failure in meeting standards set by adults. Because of their lack of conformance to adult expectations, they need to establish a workable self concept, a recognition of their own achievement and a pattern for learning. A primary consideration in the curriculum development, therefore, was the production of a step by step progress guide for teachers and the development of action settings for children. Stimuli in the settings were designed to provoke action which teachers wanted to reinforce. In the total setting, at any given moment, there were many subordinated elements which would be the objects of later focused attention.

Of prime importance in the experimental program was the learning process, the provision of a means of learning, of seeing relationships and of problem solving. The teachers were directed by their Curriculum Guide, but the introduction of stimuli was not viewed as an isolated process for increasing a number of known facts. Rather, it was conceived as the provision of new information which would lead to new discoveries for the child, to be differentiated by him, to be reassembled and reorganized and then integrated for more effective behavior patterns and readiness for other cues and materials. The cues were seen as leading the child toward next developmental steps. Readiness for new learnings was to be fostered continually and to be sought through observation of the child in the action setting; it was to be worked toward and expected, and not merely awaited.

The program was based also on the assumption that the more opportunities a child had for applying workable behavior in a variety of selected situations, the greater would be his ability to modify his actions and to cope with the environments in which he lives. Through the establishment of relationships between what he sees or experiences and how he responds, the child increases his store of usable symbols which become additional vehicles for learning. He also sets up patterns for processing the information he obtains so that it is available for use in problem solving.

Since behavior is based on previous experiences, the curriculum presented here includes sample programming used by the teachers. Recognition was given to necessary prerequisite learnings, which needed to be ascertained by the teacher prior to the child's proceeding to a next step that would involve experience with the same or similar objects in new contexts. Instruction was viewed as being tied closely to the moment of optimum attentiveness. Each new experience provided opportunity for varied application of simple generalizations made by the child while, at the same time, it afforded opportunity for teacher guidance toward increasingly effective self-directed approaches. The child's imitation of adult behavior in a relaxed but structured environment as well as his awareness and verbalization of that structure were consciously promoted to highlight continuity, to afford freedom of operation within established limits, and to further the development of attitudes of inquiry and responsibility.

The curriculum was designed to provide for an increasingly complex learning setting. Early experiences were directed toward satisfaction of basic needs. Few alternative expectations were offered and cues for response were strongly linked with the child's previous performance and interests. Teacher involvement in problem solving included verbalization of processes and interpretation of results. The goal was the child's understanding of his own activity and, later, his assumption of greater responsibility for planning and problem solving.

An important emphasis in the planned program was helping the child to consider certain elements in his total environment, with numerous opportunities to compare and contrast their relationships. A major basis for intellectual development and pre-academic activities was the wide variety of sensory stimulations achieved through handling and using groups of objects under different conditions.

Teacher orientation was directed toward recognition and appreciation of the child's changing behavior and his ability to progress in small steps. Achievement was not viewed in terms of perfected skills. Children were observed in all activities, and their behavior was studied. When progress was deemed erratic or grossly deviant from that expected, teachers appraised both their immediate objectives for the child and their selection of stimuli in the form of materials and activities for both the individuals concerned and for the total group.

Children were provided an environment conducive to the learning of physical control and social adaptation. In the process, they were encouraged to develop systematically and to maintain a pattern of continuing over-all growth.

Exploratory Stage of the Curriculum Development

In this experimental preschool program, the teaching staff came into a new situation, one without previously tried and proven guide-lines. Since no established curriculum was available for preschool children diagnosed as mentally retarded, the teaching staff created its own. The teachers had different geographic and pedagogical backgrounds, and a wealth of ideas emerged from their differences. Two of the four teachers had worked previously with retarded children and with the so-called "normal"; one had a long and varied experience in regular nursery school; and the other, understandings gained from working with young deaf and deaf-blind children.

A period of several months was required for adjustment and orientation before the teachers could actually begin to set down the amount and kinds of learnings they saw taking place within their classrooms and these to determine appropriate curriculum and teaching methods. Curriculum meetings were scheduled for a minimum of three and one-half to four hours per week. Here children were appraised, materials and equipment were surveyed, and teaching methods were evaluated; professional reading, questioning, listening and debating were promoted and made increasingly effective. The entire teaching staff also were taking advanced courses in child growth and development concurrently with the classroom teaching, and this helped to increase their insight. As the faculty became increasingly familiar with their pupils and could incorporate the strengths that each teacher offered, they evolved into a cooperatively interacting teaching and study team. Their similarities and differences were the bases for curriculum production through the use of profitable disagreements and stimulating ideas. Other staff members, such as, psychologists, medical personnel or the language developmentalist, did not participate regularly in the curriculum study group, but only joined them occasionally for specific purposes.

The program was designed as a Nursery-Kindergarten with necessary modifications made as the need for them occurred. When classroom management during the project's first few months presented new problems, the most productive curriculum sessions were those focusing on the expressed teacher needs in establishing communication with children, in introducing routines and in setting the stage for learning.

As the teachers worked with the children, areas of major teacher concern were identified, and, from there, six long range goals, or areas of competence, were established for the children in this group situation. These problem-centered categories were: 1) daily living skills, 2) cognitive and sensory-motor skills adequate for participation in subsequent school programs, 3) communication skills adequate for group conversation, cooperative planning, and evaluation of experience, 4) tolerance of a variety of simultaneously presented stimuli while selecting and sustaining interest in one stimulus, 5) understanding and ability to accept teacher values and interests different from their own, 6) extra-curricula social adjustment patterns for safe participation in activities such as swimming, field trips and playing in the park. These provided a beginning, the framework in which teachers would function in working with the children.

In addition to these objectives, however, there was need for short range goals, which, built one upon the other, would provide developmental stepping stones within the framework provided. Consequently, a three dimensional curriculum design emerged. The components of this design were: 1) a Curriculum Guide, 2) action settings for implementation, and 3) cross-sectional considerations which were the interrelationships needed in order to implement the curriculum guide within the action settings provided.

Development of the Curriculum Guide

During the first Project year, the Curriculum Guide was evolved. This basic curriculum structure consisted of 190 items, or teacher identified areas of learning, for which five-point teaching-learning sequences were developed. These scales represent the composite thinking of the Project teachers and the curriculum consultant. No attempt was made either to standardize the devices or to ensure comparable intervals. Instead, the essential purpose of the Guide was to supply a frame of reference within which school experiences were to be selected and provided in order to serve three functions: teacher direction, program balance, and assessment of child and group status.

Goals and Objectives: In working toward the Curriculum Guide, teachers directed their attention to the existing short range classroom goals, to the basis for choice and use of certain materials and equipment, to the expectations for individuals and for the total group in selected activities, and made conjectures as to reasons for the provoked child behavior. With increased recognition of goals and with growing lists of curriculum items, the teaching team was enabled to develop categories, related to the long range goals, under which the short term objectives were identified. These categories, representative of child development, were: 1) intellectual development, 2) imaginative and creative expression, 3) social development, 4) emotional development, 5) manipulative development, 6) motor development, and 7) self-help.

The language development area was omitted from these headings, since the Project language developmentalist, working closely with teachers and children, assumed considerable responsibility in defining the area and in evaluating children's status and progress. Language, in its broad sense, permeated every aspect of the curriculum and was considered as a cross-sectional emphasis.

The short term classroom goals, or Curriculum Guide items, were arbitrarily categorized, while, at the same time, recognizing that neither the categories nor the stated goals were mutually exclusive. Then, for each area of growth, five steps were identified through which the children seemed to move sequentially toward competence, maturity, and independence. The teachers expected child movement toward competence, for example, in such activities as sharing, expressing pleasure, creative rhythms, pasting, concepts of quantity, and jumping rope. To create the scales, it was necessary to identify the developmental sequence through which children seemed to progress in each of the areas. As a first step, the teachers sought the lowest and the highest levels of function in the group; next, they envisioned the functioning level to be expected for the brightest retarded child at age seven or eight years. They agreed on logical steps in moving from dependence to independence, from passivity to activity, and studied the changes and learnings which would take place as children progressed from one step to another.

For example, the steps by which children learned to use puzzles appeared to the teachers to be as follows: 1) exploration and interest, 2) physical trial and error, 3) following guide lines, 4) thoughtful trial and error, and 5) pre-placement recognition. For a child learning to relate to other children within the class, the sequence observed by the teachers was: 1) Initially a child is apparently indifferent to the others. 2) He shows awareness and interest in others. 3) He moves toward some individual or individuals. 4) A definite relationship is establishd. 5) He functions in a give and take relationship with the group.

The development of a sequence during a curriculum meeting was followed by its observation and testing in the classroom. Subsequent teacher reports were made on observed child behavior, and on comparisons of children's function, reactions, and production in relation to the sequence being analyzed. Questions were raised by teachers concerning applicability of the sequence as originally presented, and these total analyses resulted in either modification or support of the items.

Use of the Guide

Early in the second year of the Project, the duplicated Curriculum Guide was used by the teachers in checking each child's observed level of functioning on the five-point scales. Independent ratings and comments for each of three yearly evaluation periods were transferred to a form for tabulation and later comparisons. Ratings were made by the teachers from observation of the children in their activity setting rather than in a one to one testing situation. Although stimuli from other children, the class routines, and the environment as a whole had both favorable and deleterious effects on the teacher's estimations, the ratings were thought to be representative of the predictive overt behavior manifest by these children in the school setting.

Classroom Implementation: Action Settings

After development of the Curriculum Guide, attention was directed toward implementation of the guide items in the classroom. The Curriculum action settings were the scheduled activities during which children used well-established skills, were introduced to new experiences, saw relationships, sought information, experimented and solved problems.

Among the settings provided by the teachers were discussion periods, handwork activities, story telling, music experiences, juice time, free play sessions, motor activities on the roof or in the gym, swimming, cooking, and trips. In refining the preschool program, the teachers considered each setting in light of child readiness and in terms of teacher roles, materials and equipment, kinds of activities being promoted and the nature of the children's participation. The conscious discovery of these goals and experimental sequences forced the teaching team to look at each classroom activity and objective; to analyze the steps which they expected the children to take toward proficiency and understanding; and to analyze the teaching sequence in detail. There was the further need of a rationale for selection and use of classroom methods.

A central factor in programming was group cohesiveness and socialization accomplished through the variety of experiences offered, the group discussions of past and future events, and the assurance of prerequisite learning during free play activities. Purposeful manipulative activities were an adjunct to projected and past experiences both in and out of the classroom. Each activity was used to promote development toward a number of short range goals. Many concepts were introduced by means of multi-sensory techniques and in a variety of situations which provided the children with a real life experience before introducing a manipulative play experience. Swimming, for example, offered a highly motivated activity in dressing and undressing, as well as in communication, in motor development, and in socialization skills. Brought back into the classroom, this experience was used in dramatic play, in rhythms, in manipulative activities such as pasting and cutting, and in creating murals and pictures.

The third component of the curriculum design was the manner in which the action settings served to implement the Curriculum Guide items. Although neither the Guide nor the settings were designed as a course of study, both teachers and children needed a continuing direction. For the children, however, reliance was upon a natural learning sequence where relationships were determined by space, time, materials and people. Teachers maintained direction through the six long range behavioral goals, and later through the itemized Curriculum Guide. These goals, or habits of functioning, were related to: 1) motivation, 2) attention, 3) perseverance, 4) problem solving, 5) concept development and 6) oral communication. Teachers concentrated on these objectives in relevant situations, and employed the unit method in a cross-sectional approach. The units were built upon the habits, or ways of functioning being sought. The teacher was responsible for arranging the settings in such a manner as to direct child attention and behavior while the child's task was using the tools provided in the setting for expanding ideas and increasing skills.

Programming the Curriculum Guide

During the last year of Curriculum study, the Guide items were again studied individually to determine the levels of readiness which were essential for programming toward a subsequent next step in the developmental sequence. Readiness was estimated by observation of the child's predictable behavior upon which the teacher could depend and for which the child no longer seemed to require a trial-and-error approach.

Based on observations, teacher anecdotal records and confirmation in the classroom, sample activities were identified which promoted movement toward the next developmental steps. These activities represent some of the many vehicles by which children were encouraged and their growth directed. Neither the Guide items nor the programming arranged according to areas of development comprised a course of study. They were designed to supplement a curriculum sequence, not to be a curriculum sequence. In the experimental classes, prearranged experimental settings determined the activities to be presented.

The following expanded Guide item relative to coloring illustrates a programmed guide item.

COLORING

(a) THE FIVE LEVELS OF THE CURRICULUM ITEM

1. holding for use	2. scribbling	3. awareness of space	4. ability to stay within design	5. conformity to design

THE RATING BASE

(b) DEFINITION OF THE TERM: BEHAVIOR UNDER OBSERVATION

The manipulation of crayons, with attention to the eye-hand coordination involved in discerning a space and coloring within the lines bounding that space.

(c) DESCRIPTION OF BEHAVIOR OBSERVED AT EACH LEVEL

Child picked up crayons, held them; watched others using them.	Child used crayons to make marks, scribbled at random; seemed unaware of design.	Child scribbled or marked over design, crossing outlines, but staying in the general area.	Child stayed within area, usually well within.	Child colored design with fair accuracy. Crossing a boundary was accidental.

PROGRAMMING

(d) PREDICTABLE (INTERNALIZED) BEHAVIOR USED IN PROGRAMMING FOR NEXT LEVEL

holds crayon	makes marks	perceives space	limits own marks	limits mark with respect to boundaries

(e) TEACHING PROCEDURES TO ESTABLISH READINESS FOR NEXT LEVEL

Verbal attention to ways of holding crayon. Direct help in making marks with crayon.	Verbal attention to child's marks, their location, and child's movements. Direct help in staying near dotted lines. (Cutout guides if indicated.)	Discussion and comparison of drawings; verbal attention to areas covered, and to location of scribbles. Revisions.	Narrative coloring. Discussion of pictures on basis of points 1, 2, 3, and 4.	Retracing outline after coloring. Discussion and evaluation by children.

Teacher Evaluations

The basic teacher records were in the form of anecdotal accounts of daily sessions. The two teachers for each group pooled their observations in a running account of group and individual child activity. To keep the daily log within bounds, events relevant to the planned program ordinarily provided the framework. Supplementary happenings and incidents which referred to continuing problems also were included. In addition, teacher observations were focused directly upon individual children under two special circumstances:
1) the first day in class for each child, and
2) when the suitability of school placement was questioned, such as, when a child's ability to function in a group was in doubt and a check through several days of actual attendance was required. This consecutive log, maintained daily, contained information which could be utilized in teacher's records of both individual and group behavior.

Three kinds of individual records, based on the anecdotal reports, were used. They were:

1) The ratings on Curriculum Guide items made three times annually, at the beginning of a year, at mid-year, and at the end of the term.
2) A year-end summary of each child's progress during the year. In this summary, progress was reported in terms of the long-range curriculum goals.
3) A year-end report to parents, which was a condensation of the individual summary. The report to parents was considered to be the concluding phase of the child-parent-teacher relationship during the year. Older children ordinarily had an opportunity to discuss their own reports, while younger children were given whatever information they seemed ready to use.

Composite records for each class were comprised of the comprehensive annual teacher reports summarizing briefly the year's curriculum work and the classroom activities. A resume and an evaluation of group progress toward long and short range curriculum goals were a part of this survey. Information on progress in the various areas was drawn from anecdotal records and from the Curriculum Guide ratings of individual children.

Summary

The process of curriculum developed including the involvement of all those concerned resulted in a comprehensive program for preschool retarded children in a group setting. Among the questions considered were: 1) What is the basis for such a program? (assumptions), 2) What are the barriers to program operation? (teacher-oriented goals), 3) What should be happening in the school program? (child-oriented goals), 4) How should it happen? (direction-Curriculum guide), 5) What makes it happen? (methodology), 6) Why? (rationale), and 7) What did happen? (the effects). The full report on the curriculum given in Volume II attempts to answer these questions in detail.

CHAPTER **7**

SUMMARY, IMPLICATIONS AND RECOMMENDATIONS

Summary Awareness of mental retardation as a handicapping disability long has been present, and this study to determine the effects of group experience in a structured preschool program has recognized the importance of giving concerted attention to the educational needs of such children at an early age. After five years devoted to this investigation, however, not only has awareness of the problem been sharpened, but there also has evolved a new emphasis in the thinking of those who have worked with these children in the Mental Retardation Project as well as those who have analyzed the data. The focus of thinking now centers in the peculiar qualities and characteristics of children with the several types of handicap which are usually considered together under the broad general category of mental retardation. The gross disability is the same for all; it is the nature of the resulting handicap which is different. For that reason, this report has become one specifically related to a group of young educable mentally retarded children between the ages of four years-nine months and six years-nine months whose disability was sufficiently handicapping at this early age for its overt symptoms to have called attention to themselves, and this to such a degree that a medical, social or educational agency or service identified them for referral to this Project.

The commonly existing procedure of having children enter school, experience academic failure and then be identified as mentally retarded has concerned educators for a number of years. The very connotation of mental retardation as a non-obvious disability until it becomes an academic learning handicap has served to defeat efforts toward early identification. The Project children were identified prior to academic failures, and, with early identity, there has come a realization of the singular differences in this group.

In the area of general abilities, there were recorded changes in I.Q. and in M.A., but the positive direction of the changes on the Stanford-Binet tests were not consistently of sufficient size to be statistically significant. Considering the character of these subjects, the regressive effect to be expected and the proven instability of intelligence tests results with young children, the outcomes here have not appeared to be surprising. In view of the divergent results obtained with the three tests analyzed, i.e., Stanford-Binet, Merrill Palmer and Revised Columbia Maturity, and the fluctuations found in the results for the same test, there seems to be reasonable question as to the efficacy of intelligence measurements now available for use with similarly handicapped mentally retarded children.

For the tests of specific abilities, the results ranged from substantial gain which was statistically significant to a complete lack of scores for other tests that proved beyond the capabilities of the Project subjects. Because of the difficulties confronted in this area of psychological measurements, the Study has raised serious questions concerning the suitability of available tests for these young mentally retarded children.

Throughout the work of curriculum development, to which all other aspects of the study were secondary, the evolving potentials for growth and the positive influences of a variety of action setting have offered new insights for teachers of these children. As a result, there has appeared to be a need for re-evaluation of the upper limits of expected achievement, of the conditions for learning in the total environment of home and school, as well as of the educational philosophy which underlies current methodology.

It is within this general frame of reference that the broad implications of this study have been deduced and certain suggestions made. The implications and recommendations which follow are offered in tabular form in order to show more clearly their interrelatedness.

Implications	Recommendations
1. **Identification.** The problem now is not simply the construction of a suitable education and training program for young mentally retarded children, but rather it is the determination of the variations in types and degrees of handicaps among this disability group in order to prescribe a program which lends itself, through adaptation and modification, to meeting their different needs.	1. **Identification.** That a more concerted effort be made to determine appropriate and effective methods for the identification of young mentally retarded children in order that they may benefit from suitable programs at as early an age as is feasible and productive.
2. Serious deterents to early identification have been inherent in the limited knowledge about mental retardation and about the ramifications of this disability among agency and service organization personnel in the health, education and welfare fields.	2. That a pre-service and in-service educational program be instituted for personnel in the health, education and welfare services which would be designed to facilitate an informed understanding about mental retardation, its early identification, and the care and services available or needed for children with this disability.
3. **Prevalence and Socio-Economic Levels.** Since a higher percentage of children referred to the Project who met the criteria for admission were from the lower socio-economic level it has appeared that the extent of the problem is greater in this social group. If this condition reflects a valid difference in incidence and prevalence which is more extensive than this study, the implications for health, education and welfare planning are far reaching in the areas of both prevention and programming.	3. **Prevalence and Socio-Economic Levels.** That a cooperative study be made to determine the prevalence of mental retardation in the child population, and that this study undertake to determine whether socio-economic differences are factors in expected incidence.
4. **Medical Data.** The cumulative findings in this study concerning prenatal, birth and early developmental history give substantive evidence of child vulnerability to mentally disabling illness and injury, and this vulnerability has appeared to be a significant factor in anticipating special educational provisions.	4. **Medical Data.** That an *investigation be undertaken* by public health together with welfare agencies and education of the relative rates of prevalence and incidence of mental retardation and the contributing conditions, in order to attack the dual problems of prevention and program planning.
5. **Tests of General Ability.** In view of the numerous limitations found in tests of intelligence for young children, the fluctuating results in this longitudinal study imply that test scores derived from any measurement technique now available do not permit a high level of confidence in the results. Therefore, reliance has been placed and must be placed in large measure upon judgmental interpretations of data obtained without proven reliability and validity.	5. **Tests of General Ability.** That constructive attention be given to the limitations of all tests now available for measuring the intellectual capacity of young children presumed to be mentally retarded, and that concentrated research be undertaken in the area of developing reliable evaluative instruments for this use.

6. Specific Abilities. It is essentially impossible to measure a number of these abilities with techniques now available, both because of the limitations of present instruments and because of the inability to know reasonable expectations.	6. Specific Abilities. That measurement of specific abilities be devised which can be used with confidence for young children, including the mentally retarded, such as, readiness tests; tests for differentiation of familial mental retardation, special learning problems, and schizophrenia; tests of motor proficiency, etc., in order to determine ability in relation to reasonable expectancy and to plan programs to meet identified needs.
7. Parent Participation. The benefits obtained from joint parent-school cooperative efforts based upon increased understanding have raised questions concerning, (a) the optimum total environment for social and emotional development, and (b) the roles of the home and the school in an educational program of habit training.	7. Parent Participation. That critical attention be given to the role of parents in the educational process for mentally retarded children, and to the feasibility of developing a home action curriculum that would be different from the school program but complimentary to it.
8. The limited evidence from this study supports the interrelationship of measurable child growth with evolving positive parent attitudes. Although these results are inconclusive, there seems to be a trend established supporting this reciprocal effect.	8. That research be undertaken in the area of parent attitudes, including the determination of a reliable method for evaluating them, in order that correlations of parent attitudes and child learning may be made.
9. Language Development. Although statistically significant gains were made by Project subjects in language development certain problems did exist in the use of available tests with the exception of the Peabody Picture Vocabulary Test and the three Project taped evaluations, all of which were created for the mentally retarded. Since language usage is a fundamental aspect of any preschool program, reliable tests are essential not only for diagnosing individual levels of functioning but also for evaluating growth and learning.	9. Language Development. That research be directed toward developing and improving speech and language tests for use with mentally retarded children. And, it is also recommended that the hypotheses set forth in this report in the area of speech and language be investigated further in order to assess their worth as program objectives and as criteria for pupil and program evaluation.
10. Curriculum. The direction of teacher efforts in this study was toward the child's development of controls, self reliance and creative expression, and toward the removal of ceilings on growth through action. The pattern of behavior and functioning ability achieved in this preschool program has indicated that these children were capable of adjusting constructively to a rather highly teacher-oriented classroom environment. One possible implication to be drawn from this is that a more structured and directed program affords needed security, which, in turn, constitutes freedom to learn.	10. Curriculum. That further longitudinal study be carried on which would employ the emphases of this experimental program and would utilize this preschool developmental curriculum in order to determine the suitability of its contents and methodology for other young children with learning problems and retardation, and that a control group be maintained in a program employing the more traditional type curriculum, thereby affording still another test of value for the experimental curriculum.

11. Observations. The use of observational techniques, and especially of the taped reports, has offered valuable support in this study for objective program planning, implementation and evaluation.	11. Observations. That further investigation be made of the role of recorded observations in demonstration type programs to ascertain this effectiveness as a tool for program improvements and to assess their potential value in teacher education.

In conclusion, the implications of this study have appeared to be far reaching in the significant questions raised concerning present knowlege in the area of education and training for children with learning problems, including the mentally retarded. Only a few of the specific areas in which investigation and research are needed have been identified. Others are easily discernible throughout the preceding report. It is sincerely hoped that this five year cross-sectional longitudinal study may serve as a springboard for more intensive and more extensive research both in education and in the related professions to which the learning problems of young children are of vital concern. After further testing of the developmental curriculum, preferably with a control group of suitable subjects, it is anticipated that this study may be the forerunner of other curriculum projects for older mentally retarded children, employing similar objectives and emphases.

BIBLIOGRAPHY

1. Allport, Gordon. Becoming. Yale University Press, 1955.
2. Bell, John Elderkin. Projective Techniques. Longmans, Green and Co., N.Y., 1948
3. Buros, O. K. The Fourth Mental Measurements Yearbook. Gryphon Press. Highland Park, N.J., 1953.
4. Cattell, Psyche. The Measurement of Intelligence of Infants and Young Children. Psychological Corporation, New York, 1940.
5. Clark, Lois H. "Supervision as Leadership in Curriculum Development". Education 73:216-20, December, 1957.
6. Cruickshank, William M. (Ed.) Psychology of Exceptional Children and Youth. Prentice-Hall, Inc., 1955.
7. Curtis, Ethel Louise. "Building Toward Readiness in Mentally Deficient Children". American Journal of Mental Deficiency. 48: October, 1943: 183-187.
8. Doll, Edgar A. Vineland Social Maturity Scale: Manual of Directions. Education Test Bureau, Minneapolis, Minn., 1947.
9. Doll, Edgar A. (Editor), The Oseretsky Tests of Motor Proficiency. Educational Test Bureau, Educational Publishers, Inc., Minneapolis, Minn., 1940.
10. Foshay, Arthur W., "Choice of Content". Educational Leadership. 13:340-41, March, 1956.
11. Foster, J. C. and Mattson, M. L. Nursery School Education. Appleton-Century-Crafts, Inc., New York, 1939.
12. Frazier, Alexander. Research for Curriculum Improvement. 1957 Yearbook. Washington, D. C.: Association for Supervision and Curriculum Development, 1957.
13. Goodenough, Florence L. Exceptional Children. Appleton-Century-Crofts, Inc., N.Y., 1956.
14. Grune, Edward B. Measurements of Human Behavior. Odyssey Press. N. Y., 1941.
15. Hedges, Vera Lee, & others. "Opportunities for Teacher Participation in Research". Educational Leadership. 15:351-55, March, 1958.
16. Hollingworth, Leta S. The Psychology of Subnormal Children. Macmillan Company, N. Y., 1926.
17. Jersild, Arthur T. Child Psychology. 3rd. Edition. Prentice-Hall, Inc. N. Y., 1947.
18. Johnson, C. Orville and Blake, Kathryn A. Learning Performance of Retarded and Normal Children. Syracuse University Press, Syracuse, N.Y., 1960.
19. Kellog, Rhoda. Nursery School Guide. Houghton Mifflin Co., New York, 1949.
20. Kephart, N. C. "Influencing the Rate of Mental Growth in Retarded Children Through Environmental Stimulation." National Society for Study of Education 39th Yearbook, Part II. University of Chicago Press, Chicago, 1940: 223-239.

21. Kirk, Samuel A. and Johnson, G. Orville. Educating the Retarded Child. Houghton Mifflin Co., N.Y. - 1951.

22. Kirk, Samuel A. and Stevens, Irene. "A Pre-Academic Curriculum for Slow-Learning Children". American Journal of Mental Deficiency. 47: April, 1943, 396-405.

23. Pinneau, Samuel R. Changes in Intelligence Quotients. Infancy to Maturity. Houghton Mifflin Company, Boston, Mass., 1961.

24. Sarason, Seymour B. Psychological Problems in Mental Deficiency. 3rd. Edition. Harper and Brothers, N.Y., 1959.

25. Sawrey, James M. and Telford, Charles W. Educational Psychology. Allyn and Bacon, Boston - 1958.

26. Sniderman, Sam. M., The Long Range Productivity of a Subsidized and Formally Organized Action Research Curriculum Study. Doctor's Thesis, Detroit: Wayne State University, 1957.

27. Terman, Lewis M. The Measurement of Intelligence. Houghton Mifflin Co., N.Y., 1916.

28. Terman, Lewis M. and Merrill, Maud A. Measuring Intelligence. Houghton Mifflin Co., New York, 1937.

29. Thompson, George G., Gardner, Eric F. and DiVesta, Francis J. Educational Psychology. Appleton-Century-Crofts, Inc., N. Y., 1959.

30. Van Alstyne, Dorothy. The Environment of Three-Year-Old Children: Factors Related to Intelligence and Vocabulary Tests. Teachers College Contributions to Education, No. 366, Columbia University, New York, 1929.

31. Wall, W. D., Education and Mental Health. International Document Service. Columbia University Press, 1955.

APPENDIX A

1. Mental Retardation Project Tests of Specific Abilities:

- **(1) Designs**
- **(2) Imitations**
- **(3) Laterality**
- **(4) Cutting**
- **(5) Color Discrimination**
- **(6) Weights**
- **(7) Rail Walking**

2. Mental Retardation Project Speech and Language Taped Evaluations:

- **(1) Phonetic Inventory**
- **(2) Spontaneous Language Test**
- **(3) Auditory Memory Test**

1. MENTAL RETARDATION PROJECT TESTS OF SPECIFIC ABILITIES:

DESIGNS TEST

Directions:

This is not a timed test.

The examiner, sitting across from the subject, shows the child a set of 15 designs one at a time, presenting them in the order marked. The designs are on 4" x 6" white unlined cards with one design centered on each card. Cards are numbered on reverse side.

Placing a clean sheet of 8-1/2 x 11" paper and a pencil before the child, the examiner says, "I want you to draw the same thing on your paper that you see on mine," (pointing to the horizontal line on card No. 1).

When the child has duplicated the design on the first card, the examiner gives him a fresh sheet of paper, shows him card No. 2 and repeats the instructions. He then follows this procedure for the entire set of 15 designs, giving verbal encouragements and approval as needed.

(The designs used are given here in reduced size.)

Scoring:

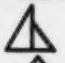
The child is credited with 1 point for each correct response without regard for location of the design on the paper insofar as centering is concerned and without penalty for its being larger or smaller than the test design. The final score for each testing period is the total number of designs correctly duplicated.

Using the tabulation form below, the item scores and final score are recorded and notes made as to the test behavior, examiner's impressions and observations and other pertinent information.

Tabulation Sheet

Designs Test

Name ______________________ Date of Admission __________ Date of Test __________

Items	Score	Items	Score
No. 1 Horizontal Line		No. 9 □ Design	
No. 2 Vertical Line		No. 10 △ Design	
No. 3 Diagonal Line		No. 11 ⬡ Design	
No. 4 ⊤ Design		No. 12 ◇ Design	
No. 5 └ Design		No. 13 ⏢ Design	
No. 6 ┘ Design		No. 14  Design	
No. 7 ○ Design		No. 15 ◇ Design	
No. 8 + Design		Total Score	

Comments: ____

____

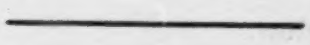
____

____

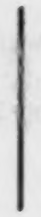
Examiner

Design Test Items

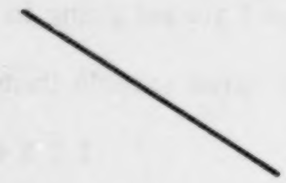
1



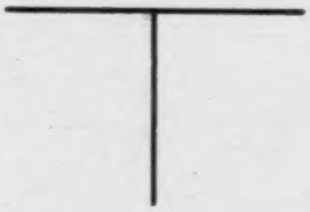
2



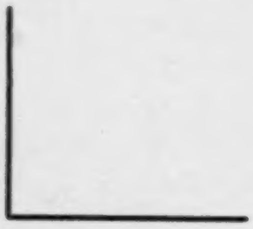
3



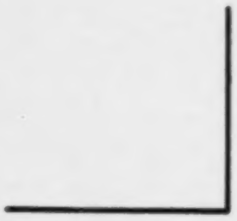
4



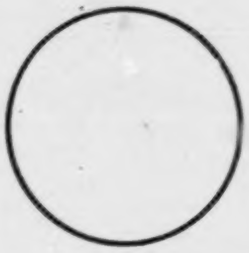
5



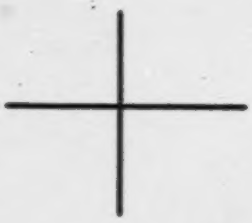
6



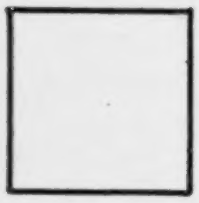
7



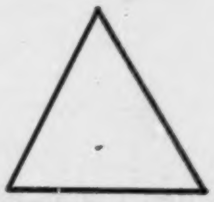
8



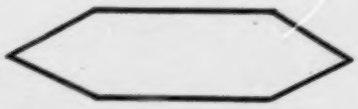
9



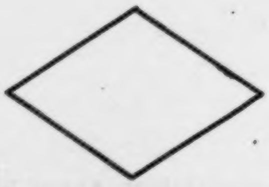
10



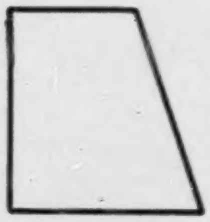
11



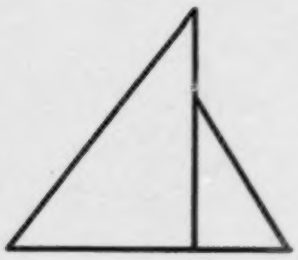
12



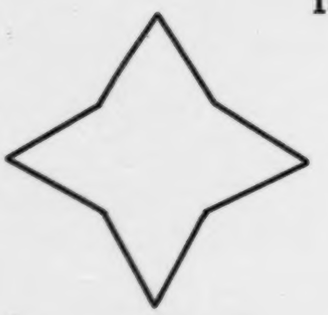
13



14



15



IMITATIONS TEST

This is not a timed test.

The examiner places a sheet of paper before the subject which has 4 columns with 3 dots in each column. (See copy below.) He then says,

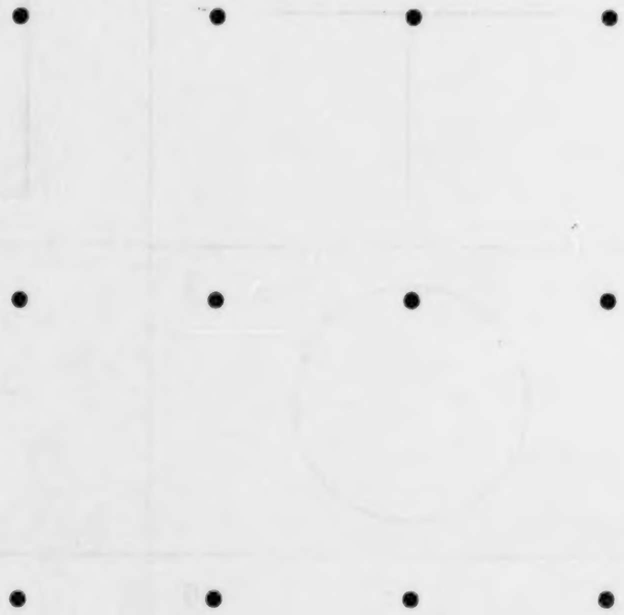
"You watch what I do. My pencil goes from here to here to here to here. Now, I am going to make marks to show just the way my pencil went. Now, let me see you do the same thing. That's fine. Let's do it again (second trial).

"This time I am not going to make any marks. I want you to make the marks to show the way my pencil went."

There are three sample items before beginning the 12 test items shown below.

Samples: 1 2 3 4
1 2 3 4 2
1 2 4 3

1 2 3 4 1
1 4 3 2
1 4 2 3
1 4 3 2 1
1 2 3 4 3 1
1 3 4 2
1 3 2 4 1
1 2 3 4 2 1
1 3 2 4 2
1 2 4 3 1
1 3 4 2 1 2
1 2 4 3 1 4



Scoring:

Using the tabulation sheet shown on the next page, each correct response is credited 1 point and the total of the number of correct items equals the final score. The maximum score is 12.

Imitations Test Tabulation Sheet

Name____________________DOT____________________________Date of Admission____________________

C.A.						
M.A.						
Date:						
Samples:						
1.						
2.						
3.						
Test:						
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
Total						

LATERALITY TEST

This is not a timed test.

One at a time the test materials are presented to the subject by placing the object to be used on the table before him. The examiner then says,

Hand

1. "I want you to take the ball and throw it over there." (pointing to an open space)
2. "I want you to take the hammer and nail and hold it as if you were going to drive the nail into the table (or board or block of wood)."
3. "I want you to pick up the toothbrush and pretend you are going to brush your teeth."
4. "Now, pick up the comb and show me how you comb your hair."
5. "I want you to take the piece of paper and the scissors and show me how well you can use the scissors to cut the paper."
6. "Show me how you shake hands." (Examiner offers his hand to the child and shakes hands.)

Eye

"I want you to pick up the card. Now, see whether you can hold it to one eye and look through the hole."

Foot

1. "Take the ball and show me how well you can kick it over there." (pointing to an open space).
2. "Show me how you hop on one foot."
3. "Let's pretend there is a fire here on the floor. Show me how you would stamp it out."

Scoring:

Using the following form, the examiner marks L and R at the top of each column on the tabulation sheet. A check is made for each response in the appropriate column. (Note example given.)

The score will be given for each testing period as Left, Right or Mixed.

Laterality

Name________________________________DOB__________________Date of Admission__________________

C.A.								
M.A.								
Date								
HAND	L	R						
1. Throw Ball		✓						
2. Hammer Nail		✓						
3. Brush Teeth		✓						
4. Comb Hair		✓						
5. Use Scissors	✓							
6. Write - Pencil	✓							
7. Shake Hands		✓						
EYE								
Look Through Card	✓							
FOOT								
1. Kick Ball		✓						
2. Hop		✓						
3. Stamp on Fire		✓						

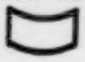
CUTTING TEST

Directions:

This is not a timed test, and it is conducted in a relaxed conversational manner between the examiner and the child.

The subject is presented one sheet at a time, beginning with the blank sheet, any cut in which constitutes the first test item. In all of the other 5 sheets, he is to cut out the line or figure given him.

The directions given by the examiner are:

1. Make a cut in the paper.
2. Follow straight line and cut.
3. Cut out the triangle.
4. Cut out the square.
5. Cut out the circle.
6. Cut out 

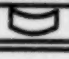
(The figures have dimensions of approximately 3 inches.)

Scoring:

Each item is scored as correct and 1 point credited if the subject follows the directions given. In those items requiring that cutting follow a line pattern, credit is given if the line is followed. The total score possible is 6.

Cutting Test Tabulation Sheet

Name________________ Date of Birth________________ Admission Date________________

C.A.							
M.A.							
Date of Test							
1. Cut in paper							
2. Straight line							
3. Triangle							
4. Square							
5. Circle							
6. 							
Total							

COLOR DISCRIMINATION TESTS

Directions:

This test has three sub-tests, color pointing, color naming and color matching. Neither of these is a timed test, the prime purpose of each being accuracy and clarity rather than speed.

Color naming: The subject is offered a color chart as follows:

Red	Blue	Yellow	Green	Black	Orange	Purple

and the examiner says, "Tell me the names of these colors."

Color Pointing: If there is no response to the above, the examiner says, "Show me the red one," etc.

Color Matching: After the above sub-tests, the examiner places before the child six colored pegs, each peg a different color, - red, green, yellow, blue, orange, purple. Then to one side he places a pile of 18 pegs and pointing to the first six, "Find me all the others that match these." Then he points to the red peg and says, "Begin by finding all the pegs that look like this." If the child does not continue, the examiner may follow this procedure with another colored peg.

Scoring:

The scoring consists of counting the number of correct responses or pegs matched in the sub-tests, with the final score being the total number of correct answers in each. See tabulation sheet which follows.

Name____ Date of Test__________________________

Color Naming and Pointing

Tell me the name of these colors:

COLORS	red	blue	yellow	green	black	orange	purple	Correct Responses
+								
-								

Matching

Find me all the others that look like this:

	Number Matched:
RED	
GREEN	
YELLOW	
BLUE	
ORANGE	
PURPLE	

WEIGHTS TEST

Directions:

1. **Comparison of Weights**

   Place the 3 gram and 15 gram weights before subject two or three inches apart. Say, "You see these blocks. They look just alike, but one of them is heavy and one is light. Try them and tell me which one is heavier." If S merely points without lifting blocks, or picks up one at random, say, "No, that is not the way. You must take the blocks in your hands and try them, like this." Illustrate. Give second trial with position of weights reversed; third trial with weights in same position as first.

   Three out of three or five out of six trials.

2. **Repeat with the 3 gram and 12 gram weights.**
3. **Repeat with the 3 gram and 9 gram weights.**
4. **Repeat with the 3 gram and 6 gram weights.**
5. **Place the 3 gram, 9 gram and 12 gram weights before the subject in random order. "See these blocks. They all look alike, don't they? But they are not alike. One is heavy, one is not quite so heavy, and one is light. I want you to find the heaviest one and place it here. Then find the one that is not so heavy and put it here. Then put the lightest one here."**

   Two out of three trials.

6. Place the 3 gram, 6 gram, 9 gram, 12 gram, and 15 gram weights before the subject in random order. Repeat the procedure in #5.

Two out of three trials.

Scoring:

With a total of 6 items, the final score is the number of correct responses within the maximum number of trials allowed. The highest score possible is 6, with 1 point for each correct response. See tabulation form which follows.

Scoring Sheet for Weights

Name ______________________ DOT ______________ Date of Admission ______________
Examiner ______________________

1. 3 and 15 a b c d e f

2. 3 and 12 a b c d e f

3. 3 and 9 a b c d e f

4. 3 and 6 a b c d e f

5. 3 9 12
   3 9 12
   3 9 12

6. 3 6 9 12 15
   3 6 9 12 15

Weights Test Tabulation Sheets

Name ______________________ DOT ______________ Dat of Admission ______________

C.A.						
M.A.						
Date						
1.						
2.						
3.						
4.						
5.						
6.						
Total						

RAIL WALKING TESTS

Materials: (Rails)

One four inches in width - 9 feet long
One two inches in width - 9 feet long
One one inch in width - 6 feet long

Lines on rails indicate feet in length walked.

Directions: Subject walks barefooted on rails. Examiner first demonstrates the rail-walking procedure. Says: "Did you ever walk a rail? Watch me as I do it, taking care to touch the heel of one foot to the toe of the other, and taking my time to reach the end without falling off."

Examiner does this. Then says: "Now let's see you try it." Waits. "Be careful to walk heel to toe and take your time. Balance yourself the best you can so that you do not fall off before you reach the end."

Subject makes 3 trips across each rail.

(See test items which follow.)

Scoring: "An attempt" is recorded when the subject falls off the rail before the full body weight is thrown on to the second foot. Beyond this point a "trial" is recorded and scoring commences. Five attempts are counted as one trial. An accustoming run is allowed on rail 2. This is not permitted on rail 3. Raw score is number of feet walked during the three trials on each of the three rails, nine trials in all. Measurement is to the toe of last foot making correct placement. Minimal score must be 9 points to go on to the next rail.

(S. Roy Heath, Jr. Am. J. Psychol 57, 482-499, Oct 144.
Norms to be obtained from author, Department of Psychology, Princeton University)

Railwalking Test

Name
Date of Birth
CA
Date of Test

1. Let me see you stand on your toes. Let me see how long you can stay there. Time in sec.______
2. Let me see you stand on one foot. Let me see how long you can stand on one foot. Time in sec.______ Foot______
3. Let me see you stand on the other foot. Let me see how long you can stand on that foot. Time in sec.______ Foot______
4. Let me see you jump on one foot. (hop) Number of hops______ Foot______
5. Let me see you jump on the other foot. Number of hops______ Foot______
6. Let me see you make the biggest step you can. Dist. in inches______ Foot______
7. Let me see you make the smallest step you can. Dist. in inches______ Foot______

Railwalking Test (Cont.)

8. Let me see you walk on the rail. (Three trials for each rail)

Dist. in Ft. ____________

Rail I ______ ______ ______

Rail II ______ ______ ______

Rail III ______ ______ ______

9. Let me see you put one foot right in front of the other like this (heel to toe demonstrate) (indicate starting foot)

No. of steps______ Foot______

10. Let me see you walk on the rail just the way you did it on the floor. (Indicate number of feet on rail)

Rail I ______ ______ ______

Rail II ______ ______ ______

Rail III ______ ______ ______

2. MENTAL RETARDATION PROJECT

SPEECH AND LANGUAGE TAPED EVALUATIONS

PHONETIC INVENTORY

Materials:

Bryngelson - Glaspey Speech Improvement Cards
Picto-Word Flash Cards
Food Cards

Procedure:

In the phonetic inventory the child is asked to identify thirty cards in a prescribed order. The cards have been selected so that the child will be articulating consonants in the initial, medial and final positions of words. An example for the s sound in all positions would be: sandwich, pencil, house. Responses are recorded on a tape recorder.

Directions:

Present the cards one at a time in the following order.

Bryngelson-Glaspey:

1. pencil
2. house
3. sheep
4. doll
5. airplane
6. knife
7. leaf
8. fist
9. wagon

Picto-Word Flash:

10. bed
11. elephant
12. pig
13. table
14. window

Bryngelson-Glaspey:

15. mother
16. bathtub
17. cake
18. rabbit
19. girl
20. chicken
21. teacher
22. watch

Food Cards:

23. milk
24. hamburger
25. pudding
26. orange
27. ham
28. jello
29. mashed potatoes
30. sandwich

Say to the child: "I'M GOING TO SHOW YOU SOME PICTURES AND I WANT YOU TO TELL ME ABOUT THEM." Present picture 1. "WHAT DID YOU SEE HERE?" If child has difficulty identifying a picture, give him a choice. For example, if a child doesn't know name for sheep, ask him: "IS THIS A SHEEP OR A CHAIR?" This is usually effective. Continue presenting the remaining cards together with questions necessary until a response pattern has been established.

Phonetic Inventory Tabulation Sheet

Name:______________________________________**Code No:**_____________**Date:**____________________

Key: Mark sound substituted, - for omission, for distortion

Age	Sound	Initial	Medial	Final	Isolation	Comments
3-1/2	p					
3-1/2	b					
3-1/2	m					
3-1/2	h			***		
3-1/2	w			***		
4-1/2	t					
4-1/2	d					
4-1/2	n					
4-1/2	k					
4-1/2	g					
4-1/2	ng	***				
4-1/2	y			***		
5-1/2	f					
6-1/2	sh					
6-1/2	zh	***				
6-1/2	v					
6-1/2	th					
6-1/2	l					
7-1/2	s					
7-1/2	ch					
7-1/2	z					
7-1/2	j					
7-1/2	th					
7-1/2	r					
7-1/2	hw			***		

Phonetic Inventory Transcription Record

Tape No.________________Code No.____________Recording Date________________
Transcribed by____________________Transcription Date____________________
Name of Child____________________

Item	Response	Part of Speech	Type and length of response
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			
26.			
27.			
28.			
29.			
30.			

SPONTANEOUS LANGUAGE TEST

Materials:

"What We Do" series of pictures.

Procedure:

Responses are recorded on tape recorder.
Pictures are presented in numbered sequence.

Spontaneous language is evoked by showing the six pictures depicting familiar activities of children, i.e., a boy brushing his teeth, children playing with toys, etc. The child is encouraged to talk about the activities in the pictures.

Directions:

Say to the child: I'M GOING TO SHOW YOU SOME PICTURES. Wait a few seconds to allow child to comment spontaneously. If these is no response, say: TELL ME ABOUT THE PICTURE. If still no response: WHAT IS THE LITTLE BOY DOING. THAT'S RIGHT. WHAT ELSE DO YOU SEE, and so on until child responds.

Spontaneous Language Transcription Record

Tape No.____________________ Code No.__________ Recording Date__________________
Transcribed by______________________________ Transcription Date_______________
Name of Child______________________________ Sheet No.____________________

Stimulus Item	Response	Part of Speech	Type and length of response

AUDITORY MEMORY TEST

Procedure:

1. **Turn on tape recorder.**
2. **Present instructions.**
3. **Present vowel series in order listed.**
4. **Present consonant series in order listed.**
5. **Present consonant-vowel series in order listed.**

6. Sounds should be presented in monotone without accent or rhythm at the rate of one per second; a short period of silence between the sounds makes each one a complete sound-unit in itself.

Instructions:

WE'RE GOING TO PLAY A GAME. I'M GOING TO SAY SOME SOUNDS AND I WANT YOU TO SAY THEM JUST THE WAY I DO. YOU LISTEN CAREFULLY AND SAY THEM JUST THE WAY I DO. I'LL SAY IT. THEN YOU SAY IT. ARE YOU READY?

SAY I (Repeat direction until response is established.)

(2) ɪ
(3) ɛ
(4) a
(5) u
(6) ʊ
(7) ɔ
(8) ɝ
(9) ɜ
(10) ʌ
(11) eɪ
(12) aɪ
(13) oʊ
(14) aʊ
(15) ɔɪ
(16' ju

NOW I'M GOING TO SAY SOME DIFFERENT SOUNDS AND I WANT YOU TO SAY THEM JUST THE WAY I DO. YOU LISTEN CAREFULLY AND SAY THEM JUST THE WAY I DO. I'LL SAY IT. THEN YOU SAY IT. ARE YOU READY? SAY p (Repeat direction until response pattern is established.)

(2) b
(3) m
(4) h
(5) w
(6) t
(7) d
(8) n
(9) k
(10) g
(11) ng
(12) y
(13) f
(14) sh
(15) zh
(16) v
(17) th
(18) l
(19) s
(20) ch
(21) z
(22) j
(23) th
(24) r
(25) hw

NOW I'M GOING TO SAY SOME DIFFERENT SOUNDS AND SEE HOW MANY OF THEM YOU CAN REMEMBER. I'LL SAY THEM. THEN YOU SAY THEM. ARE YOU READY?

SAY p K (Repeat direction until response pattern is established.)

fʌ	pʌ	pʌ		
kʌ	fʌ	fʌ		
sʌ	kʌ	kʌ		
tʌ	sʌ	sʌ	pʌ	
pʌ	tʌ	tʌ	fʌ	
fʌ	pʌ	pʌ	kʌ	sʌ
kʌ	fʌ		sʌ	tʌ

It is important for the tester to say each sound only once. Otherwise, when the tape is played back the listener may take the second articulation for that of the child.

The second half of the Auditory Memory Test is used to test a child's ability to repeat after the tester a group of two, three or four sounds.

Say to the child: NOW I'M GOING TO SAY SOME DIFFERENT SOUND TO SEE HOW MANY OF THEM YOU CAN REMEMBER. WHILE I'M TALKING I WANT YOU TO KEEP YOUR LIPS STILL, THEN WHEN I'M FINISHED I WANT YOU TO SAY THE SOUNDS JUST THE WAY I DID. I'LL TALK. THEN YOU TALK. READY? SAY. . . (It is a wise practice to shut off the tape recorder while explaining the instructions for the Auditory Memory Test. Otherwise there is a risk of not having enough tape to finish the test if you are using small spools of tape with portable recorder.)

When the child says two sound groups in a row incorrectly, discontinue the test.

Auditory Memory Transcription Record

Tape No.__________**Code No.**__________**Recording Date**__________
Transcribed by__________**Transcription Date**__________
Name of Child__________

Item	Response
1. i	
2. ɪ	
3. ɛ	
4. æ	
5. u	
6. ʊ	
7. ɔ	
8. ɝ	
9. ɜ	
10. ʌ	
11. eɪ	
12. aɪ	
13. oʊ	
14. aʊ	
15. ɔɪ	
16. ju	

Item	Response
1. p	
2. b	
3. m	
4. h	
5. w	
6. t	
7. d	
8. n	
9. k	
10. g	
11. ŋ	
12. y	
13. f	
14. ʃ	
15. ʒ	
16. v	
17. ð	
18. l	
19. s	
20. tʃ	
21. z	
22. j	
23. θ	
24. r	
25. hw	

Item	Response
1. pʌ kʌ	
2. fʌ pʌ	
3. kʌ fʌ pʌ	
4. sʌ kʌ fʌ	
5. tʌ sʌ kʌ pʌ	
6. pʌ tʌ sʌ fʌ	
7. fʌ pʌ tʌ kʌ sʌ	
8. kʌ fʌ pʌ sʌ tʌ	

APPENDIX B

1. **Mental Retardation Project Observation Guide and Material and Activity Chart**
2. **An Analysis of the Social Interaction of a Group of Educable Mentally Retarded Children: A Working Paper on use of a Sociometric Technique - Charles C. Bovee**

SUMMARY OF OBSERVER'S NOTES

Name ______________________ School year ________________ Obs. __________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
MANIPULATIVE										
Cuts with scissors:										
by poking paper										
with tearing										
fringes										
short strips										
long strips										
through whole sheet										
approximating a pattern										
following a pattern										
Draws with pencil, crayon, chalk:										
marks with side of crayon/chalk										
hold between first two fingers										
holds with palm around end										
holds close to upper end										
holds with thumb and finger extended										
holds with thumb, index, and second finger										
fist grasp										
some modification of fist grasp										
uses either hand										
transfers from one hand to other										
selects crayon from box										
vertical lines only										
horizontal lines only										
diagonal lines only										
circular lines										
combinations of vertical, etc., lines										
takes paper off crayon										
Uses clay/dough:										
rolls										
pats										
pokes with finger										
cuts with stick										
breaks pieces off										
smooths till flat										
pinches pieces together										
Turns pages in book:										
one at a time										
several together										
Sorts one from a stack:										
paper										
records										
cups										
books										
Places blocks:										
side by side										
stack of 2										
stack of 3 or more										

Name ____________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(MANIPULATIVE cont.)										
Uses cars and trucks on block track or road										
Shifts gestalt re. blocks										
Puts top on small box										
Takes puzzle apart										
Puts large pieces in puzzle										
Puts small pieces in puzzle										
Puts large pegs in pegboard										
Puts small pegs in pegboard										
Places lotto picture on board										
Places lotto picture correctly										
Makes designs with tinker toys										
Turns wheels on cars, toys, etc.										
Fingerpaints/pastes:										
with linear motion										
with circular motion										
scrubs paint on										
uses tips of fingers										
uses whole palm										
Paints with brush:										
horizontal lines										
diagonal lines										
circular lines										
with heavy strokes										
with light strokes										
scrubs paint on										
stirs paint										
Buttons clothes:										
attempts										
buttons several										
buttons all but top										
buttons all										
buttons all correctly										
Unbuckles belt										
Snaps										
Unhooks suspenders										
Hooks suspenders										
Use of Zipper:										
unzips pants										
unzips sweater										
unzips coat										
zips pants										
zips sweater										
zips coats										
zips after someone starts it										
Picks nose										
Rubs eyes										
Twists Hair										
Fingers in mouth										

Name ______________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
MOTOR										
Runs:										
with feet flat										
with feet sliding										
with wide base										
on toes										
with skipping										
with knees bending loosely										
with knees high										
with arms waving										
with arms in "stereotyped" position										
with hands at small of back										
unsteadily, with slipping										
unsteadily, with stumbling										
Stands:										
with group										
behind other children										
off by self										
off by self, watching others										
rocking back and forth										
quietly, with arms at sides										
quietly, with mouth open										
with much tension in body										
swinging toy										
with hand in or near pocket										
from sitting position on floor without using hands										
from sitting position on floor with support of something or someone										
Kneels										
Squats										
Sits:										
straight in chair										
slumped in chair										
with chair tilted										
rocking chair back and forth										
rocking self back and forth										
with arms over back of chair										
sideways in chair										
with one leg under him										
with both feet on floor										
with legs crossed										
moving in chair										
with much tension in body										
holding object										
with elbows on table										
looking off in distance										
with head resting on hand or arm										
with group										
off by self										
on window sill										

Name ______________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(MOTOR cont.)										
Sits (cont.):										
on floor, frog fashion										
on floor, legs extended										
on table										
in wagon/buggy										
in large box										
Lies:										
on floor										
on table										
motionless										
on back										
on side										
swimming fashion										
curled up										
Walks:										
slowly										
rapidly										
very rapidly										
wandering										
with bouncing walk, knees bent										
with shuffling movement										
with much tension in legs and body										
carrying object										
with feet stamping										
with arms swinging										
with arms hanging at sides										
with mouth open										
with head back, looking through lowered lids										
with reciprocal leg action up steps										
with reciprocal leg action down steps										
stumbles often										
Gets up by self when falls										
Bends from waist to reach floor										
Slides on slide:										
holding on										
with someone with him										
with someone helping him										
independently										
on stomach										
on back										
sitting										
head first on stomach										
refuses										
accepts with urging										

Name ______________________________

Type of behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(MOTOR cont.)										
Eats:										
large bites										
small bites										
nibbles										
whole cookie at one bite										
holds cookie in mouth with finger										
holds cookie in one hand while eats one from other hand										
chews with mouth open										
Drinks:										
holds cup with one hand										
holds cup with both hands										
without spilling										
pours without spilling										
pours without looking										
squeezes cup										
bites on cup										
Dresses:										
puts coat on										
takes coat off										
takes hat off										
puts hat on straight										
takes shoes off										
puts shoes on										
puts gloves on										
pulls on coat/smock, etc. after someone starts it										
takes boots off										
puts boots on										
takes snowpants off										
pulls snowpants on after someone starts them										
puts snowpants on										
puts mittens on										
Uses both hands in:										
clapping to music										
playing musical instrument										
playing in sand										
playing with clay/dough										
pushing large toys										
Plays Piano:										
bangs on it										
sings while playing										
plays with rhythm while singing tune										
hits keys softly										
plays with one finger										
turns pages in the music book as plays										

Name ______________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(MOTOR cont.)										
Facial movement:										
mouth often open—mongoloid										
mouth often open—non-mongoloid										
tongue protrudes										
makes chewing movements with mouth										
purses lips										
licks lips often										
tongue movement inside mouth										
jaw movement										
squints										
tic near mouth/eye										
extreme muscle tension										
smiling movement (without humor)										
Sucks:										
thumb										
finger										
hand										
Climbs:										
easily										
with difficulty										
Jumps:										
as stands										
by self from height										
Dances										
Rides bike:										
circular riding due to steering										
with difficulty										
slowly and easily										
rapidly and easily										
Rides scooter:										
with difficulty										
easily for short distance										
easily for long distance										
Pushes wagon with one leg										
Ride's tractor:										
with difficulty										
easily and slowly										
easily and rapidly										
Ball:										
traps with arms or body										
catches from bounce										
catches from height										
throws with direction										
bounces										
bounces and catches										

Name ______________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(MOTOR cont.)										
Jumps rope:										
attempts										
jumps at proper time										
jumps into rope										
jumps without awareness of where rope is										
Holds telephone, talks into it										
Looks in mirror										
EMOTIONAL										
Smiles										
Laughs										
Frowns										
Cries:										
when hurt										
when annoyed										
when frustrated										
for no apparent reason										
does not cry										
Screams/yells when:										
no apparent reason										
joyous										
frightened										
angry										
frustrated										
excited										
Tension in:										
face										
body										
Excess bodily movement in:										
legs										
arms										
shoulders										
head										
Whines										
Bites:										
hand										
arm										
Claps hands										
Exclaims										
Jumps										
Pouts										
Blinks eyes										
Startle pattern										

Name ______________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
LANGUAGE AND SPEECH										
General Use										
Talks aloud to self										
Conversations with others:										
initiates										
continues										
responds when another initiates										
uses "stereotyped" conversation patterns										
Asks questions:										
in sequence										
repeats same question										
repeats same question with concern for response										
Answers questions:										
"logically"										
repeats same answer										
ignores										
Asks child to:										
play										
help										
sympathize										
Asks adult to:										
play										
help										
sympathize										
Uses:										
vocalizations										
verbalizations										
gestures										
one or two words										
phrases										
sentences										
Uses gesture:										
hands										
head										
body										
When an adult talks to him:										
looks at										
looks at with head back										
looks down										
smiles										
moves away										
When a child talks to him:										
looks at										
looks at with head down										

Name ____________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(LANGUAGE AND SPEECH cont.)										
General Use (cont.)										
When a child talks to him (cont.):										
looks down										
smiles										
moves away										
While communicating with others:										
tension in face										
tension in body										
appears relatively relaxed										
Mechanics of Speech										
Volume:										
extremely loud										
loud										
appropriate loudness										
soft										
whispers										
Rate:										
extremely rapid										
rapid										
within normal range										
slow										
Quality and Pitch:										
hoarse										
high pitched										
low pitched										
nasal										
RELATEDNESS WITH CHILDREN										
Parallel play										
Takes turns										
Cooperative play:										
in kitchen area										
with water										
on roof										
in playing with carriage, wagon, large box										
in music time										
with telephones										
Ignores										
Conversation with										
Watches when:										
crying										
playing										
sick										

Name ____________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(RELATEDNESS WITH CHILDREN cont.)										
Says their names										
Holds hands in hall										
Imitates actions										
Leans close to										
Touches/pats/hug, with smile										
Accepts their touching, hugging										
Resists their touching/hugging										
Laughs at										
Smiles at										
In play:										
hits										
pushes										
runs after										
yells at										
When attacked:										
fights back										
holds on										
withdraws										
hides										
runs after										
Teases										
Gives toys to										
Takes their toys										
Pushes objects into them										
Pushes										
Hits										
Pinches										
Pulls hair										
Indian burn										
Kicks										
Puts feet on										
Pulls clothes										
Lies on										
Frowns at										
Takes clothes to										
Tries to put their clothes on:										
them										
self										
RELATEDNESS WITH ADULTS										
Conversation:										
initiates										
responds with conversation										
Asks questions										
Answers questions										

Name ______________________________

Type of Behavior	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June
(RELATEDNESS WITH ADULTS cont.)										
Sits close to										
Leans against										
Puts face close										
Touches										
Holds onto										
Holds hand in walking										
Greets at door										
Smiles at										
Throws arms around										
Brings objects to										
Carries belongings										
Wants to go with										
Says "you're nice"										
Teases										
Follows directions										
Helps during activity:										
initiates										
on request										
Calls adult "Mommy"										
Calls adult by another name										
Calls names, e.g., "stupid"										
Makes faces at										
Tells "shut-up/go-away", etc.										
Pinches										
Kicks										
Hits										
Pushes										
Resists touching										
Resists direction										
Ignores direction, after name is called										

MATERIAL & ACTIVITY CHART

CHILD (name) Date___Time___to___Obs.___T1___T2___Other adults___

J	
R	
J	
J	
J	
K	
B	
B	
D	
L	
M	
A	
M	
S	
S	

APPENDIX C

1. a. Revised Stanford-Binet, Form L, Test Results for Experimental Subjects, 1957-1961.

   b. Revised Stanford-Bined, Form L, Test Results for CRMD Comparison Subjects, 1958-1961.

2. a. Merrill-Palmer Test Results for Experimental Subjects, 1958-1961.

   b. Merrill-Palmer Test Results for CRMD Comparison Subjects, 1958-1961.

3. a. Revised Columbia Mental Maturity Test Results for Experimental Subjects, 1958-1961.

   b. Revised Columbia Mental Maturity Test Results for CRMD Comparison Subjects, 1958 1961.

4. a. Academic Readiness Test Results (Laterality, Cutting, Color) for Experimental Subjects, 1958-1961.

   b. Academic Readiness Test Results (Laterality, Cutting, Color) for CRMD Comparison Subjects, 1958-1961.

5. a. Speech and Language Test Results for Experimental Subjects, 1958-1961.

   b. Speech and Language Test Results for CRMD Comparison Subjects, 1958-1961.

6. Results Obtained for Experimental Subjects on Wide Range Achievements Tests in Relation to M.A., Race, Sex, No. Days in Project Classes and Socio-Economic Level, 1961.

1a. Revised Stanford-Binet, Form L, Test Results for Experimental Subjects, 1957-1961

C.A., I.Q. and M.A.

Subjects (Lower Socio-economic group)		First Test			Exit Test			I.Q.	Follow-up			Overall
		C.A.	I.Q.	M.A.	C.A.	I.Q.	M.A.	Change	C.A.	I.Q.	M.A.	I.Q. Change
	1	5-10	N.S.	N.S.	6-6	65	4-2	-	State Residential School			
	2	5-11	66	3-11	6-6	70	4-6	+4	9-5	71	6-8	+5
	3	6-6	50	3-5	7-2	52	3-8	+2	9-8	44	4-4	-6
1958	4	6-10	69	4-8	7-5	72	5-3	+3	10-0	73	7-4	+4
	5	6-8	61	4-0	7-2	75	5-3	+14	9-9	74	7-2	+13
	6	6-0	52	3-1	6-7	60	3-10	+8	9-2	71	6-6	+19
	7	6-0	53	3-2	6-7	58	3-10	+5	9-6	50	4-9	-3
	8	5-9	63	3-9	6-6	67	4-3	+4	9-3	73	6-11	+10
	9	6-4	66	3-11	6-11	72	4-10	+6	State Residential School			
	10	5-3	39	2-2	6-11	40	2-9	+1	8-7	48	4-1	+9
	11	5-11	61	3-5	6-8	79	5-2	+18	8-4	70	5-10	+9
1959	12	5-2	50	2-6	6-9	55	3-8	+5	8-6	55	4-8	+5
	13	5-0	44	2-5	6-8	35	2-4	-9	8-9	34	2-10	-10
	14	6-4	58	3-5	6-7	67	4-4	+9	8-2	60	4-11	+2
	15	5-1	57	3-0	6-9	68	4-9	+11	8-5	57	4-10	0
	16	5-9	54	3-2	7-5	64	4-8	+10	9-1	63	5-9	+9
	17	5-11	72	4-2	6-11	74	5-0	+2	7-9	71	5-6	-1
	18	5-6	51	2-9	7-3	39	2-9	-12	8-1	45	3-8	-6
	19	4-11	53	2-7	6-6	58	3-8	+5	7-3	64	4-8	+11
1960	20	5-7	48	2-7	7-3	56	4-0	+8	8-0	49	3-11	+1
	21	5-6	73	4-1	6-10	80	5-5	+7	7-7	81	6-2	+8
	22	6-4	68	4-3	7-5	71	5-2	+3	8-2	77	6-3	+9
	23	5-9	60	3-4	7-0	65	4-6	+5	7-10	59	4-7	-1
	24	6-1	69	3-11	6-7	77	5-0	+8	7-5	81	6-0	+12
	25	5-11	60	3-6	7-6	71	5-2	+11	-	-	-	-
	26	5-11	59	3-5	7-1	66	4-7	+7	-	-	-	-
	27	5-5	51	2-7	7-2	67	4-8	+16	-	-	-	-
	28	5-11	57	3-1	7-6	55	4-0	+3	-	-	-	-
1961	29	5-6	70	3-10	6-6	68	4-4	-2	-	-	-	-
	30	5-7	73	4-0	7-2	83	5-10	+10	-	-	-	-
	31	5-3	61	3-2	6-9	85	5-8	+24	-	-	-	-
	32	5-8	63	3-6	7-3	72	5-2	+9	-	-	-	-
	33	5-7	61	3-5	6-7	69	4-11	+8	-	-	-	-
Means		5-9	59	3-5	6-11	65	4-5	+6	8-7	62	5-4	+4
Higher socio-economic group												
	34	6-3	51	3-1	6-6	51	3-3	0	9-1	64	5-10	+13
1958	35	5-10	50	2-11	6-6	56	3-6	+6	9-1	56	5-1	+6
	36	5-10	59	3-8	6-7	56	3-7	-3	9-2	54	5-0	-5
	37	6-7	55	3-6	7-1	62	4-4	+7	9-0	59	5-4	+4
	38	6-7	58	3-6	7-4	53	3-10	-5	9-0	52	4-8	-6
	39	5-10	56	3-3	7-0	57	4-0	+1	8-8	58	5-0	+2
1959	40	4-10	72	3-7	6-7	82	5-3	+10	Moved out of state			
	41	5-9	63	3-9	7-3	67	4-10	+4	8-11	72	6-5	+9
	42	5-0	48	2-6	6-7	46	3-0	-2	8-2	61	5-0	+13
	43	5-3	40	2-4	6-11	44	3-0	+4	-	N.A.	N.A.	-
	44	5-8	52	2-9	7-5	58	4-2	+6	8-0	60	4-10	+8
	45	5-1	62	3-1	7-0	66	4-6	+4	7-9	66	5-1	+4
	46	5-0	58	2-11	6-9	92	6-1	+34	7-7	79	6-0	+21
1960	47	5-1	58	2-11	6-7	90	5-9	+32	7-5	88	6-6	+30
	48	6-1	60	3-7	7-2	58	4-1	-2	7-11	57	4-6	-3
	49	5-3	60	2-11	6-11	70	4-9	+10	7-11	60	4-9	0
	50	5-7	74	4-1	6-7	75	4-11	+1	7-5	76	5-8	+2
	51	5-0	57	2-10	6-5	63	4-7	+6	-	-	-	-
1961	52	5-4	57	3-0	7-4	66	4-9	+9	-	-	-	-
	53	6-0	61	3-8	7-3	58	4-2	-3	-	-	-	-
	54	5-1	59	2-6	6-9	63	4-2	+4	-	-	-	-
Means		5-7	58	3-2	6-11	63	4-4	+6	8-4	64	5-4	+7
Total Means		5-8	58	3-3	6-11	65	4-5	+6	8-6	63	5-4	+5

1b. Revised Stanford-Binet, Form L, Test Results for Comparison Subjects, 1958-1961

Subjects	C.A., I.Q. and M.A.										
(Lower Socio-economic group)	First Test			Intermediate			I.Q. Change	Final Test			Overall I.Q. Change
	C.A.	I.Q.	M.A.	C.A.	I.Q.	M.A.		C.A.	I.Q.	M.A.	
C1	6-8	74	4-11	7-10	83	6-6	+ 9	8-8	81	7-0	+ 7
C2	7-4	75	5-6	8-5	77	6-6	+ 2	9-4	77	7-2	+ 2
C3	8-1	74	6-0	9-0	60	5-5	-14	9-9	61	5-11	-13
C4	8-6	62	5-3	9-7	54	5-2	- 8	10-6	57	6-0	- 5
C5	8-0	53	4-3	8-10	55	4-10	+ 2	9-8	64	6-2	+11
C6	7-4	65	4-9	8-3	77	6-4	+12	9-0	70	6-4	+ 5
C7	9-0	67	6-0	9-9	62	6-0	- 5	10-10	60	6-6	- 7
C8	8-5	73	6-2	9-6	74	7-0	+ 1	10-5	70	7-4	- 3
C9	9-0	54	4-10	9-9	54	5-3	0	11-1	51	5-8	- 3
C10	8-0	69	5-6	8-10	78	6-11	+ 9	9-9	75	7-4	+ 6
C11	7-1	68	4-10	8-3	57	4-8	-11	9-2	57	5-3	-11
C12	7-9	51	3-11	NA	NA	NA	-	9-10	48	4-9	- 3
C13	7-3	67	4-10	8-4	67	5-7	0	9-3	81	7-6	+14
C14	7-8	67	5-2	8-7	65	5-7	- 2	9-6	70	6-8	+ 3
C15	8-9	66	5-9	9-9	63	6-0	- 3	10-8	66	7-0	0
C16	8-6	68	5-9	9-7	66	6-4	- 2	10-5	70	7-4	+ 2
Means	7-12	66	5-3	8-11	66	5-10	- 1	9-10	66	6-6	0
(Higher Socio-economic group)											
C17	8-8	57	4-11	9-7	55	5-3	- 2	10-5	46	4-10	-11
C18	8-1	44	3-7	9-6	53	5-0	+ 9	10-1	51	5-2	+ 7
C19	7-7	62	4-8	NA	NA	NA	-	NA	NA	NA	-
C20	8-0	66	5-3	9-2	63	5-9	- 3	10-0	62	6-2	- 4
C21	7-11	58	4-7	9-1	60	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
C22	7-3	56	4-1	8-5	49	4-1	- 7	9-5	52	4-11	- 4
C23	8-4	60	5-0	9-6	59	5-7	- 1	10-4	54	5-7	- 6
C24	7-0	57	4-0	8-2	56	4-7	- 1	9-0	56	5-0	- 1
C25	7-3	68	4-11	8-4	62	5-2	- 6	9-4	60	5-7	- 8
C26	7-6	62	4-8	8-5	58	4-11	- 4	9-4	57	5-4	- 5
C27	8-8	73	6-4	9-10	73	7-2	0	10-7	71	7-6	- 2
C28	7-0	63	4-5	8-0	64	5-1	+ 1	9-0	70	6-4	+ 7
Means	7-9	60	4-8	8-11	59	5-3	- 1	9-9	58	5-8	- 2
Total Means	7-11	64	5-0	8-11	63	5-7	- 1	9-10	63	6-2	- 1

2a. Merrill-Palmer Test Results for Experimental Subjects, 1958-1961

Subjects		C.A., I.Q. and M.A.										
(Lower Socio-economic group)		First Test			Exit Test			I.Q.	Last Follow-up			Overall
		C.A.	I.Q.	M.A.	C.A.	I.Q.	M.A.	Changes	C.A.	I.Q.	M.A.	I.Q. Changes
1958	1				6-6	79	5-2	-	NA	NA	NA	-
	2				6-5	82	5-3	-	9-5	69	6-6+	-13
	3	TEST			7-1	46	3-3	-	9-10	42	4-1	- 4
	4		NOT		7-3	86	6-3	-	10-0	65	6-6+	-21
	5		IN		7-1	71	5-0	-	9-9	67	6-6+	- 4
	6			USE	6-5	71	4-7	-	9-2	71	6-6+	0
	7				6-6	56	3-8	-	9-6	48	4-7	- 8
	8				6-5	91	5-10	-	9-3	68	6-6+	-23
1959	9	6-5	65	4-2	6-11	76	5-2	+11	NA	NA	NA	-
	10	5-10	46	2-8	6-11	46	3-2	0	8-7	43	4-0	- 3
	11	6-1	68	4-2	6-7	77	5-1	+ 9	8-4	75	6-3	+ 7
	12	5-8	49	2-9	6-8	56	3-9	+ 7	8-6	53	4-6	+ 4
	13	5-7	51	2-10	6-7	41	2-8	-10	8-5	39	3-3	-12
	14	6-3	53	3-4	6-6	63	4-1	+10	8-2	51	4-2	- 2
	15	5-8	51	2-11	6-9	62	4-2	+11	8-5	54	4-7	+ 3
	16	6-5	60	3-10	7-5	64	4-9	+ 4	9-1	72	6-6+	+12
1960	17	5-11	61	3-7	6-9	62	4-2	+ 1	7-9	71	5-6	+10
	18	5-8	44	2-6	7-1	45	3-2	+ 1	8-1	47	3-10	+ 3
	19	4-11	53	2-7	6-5	57	3-8	+ 4	7-3	62	4-6	+ 9
	20	5-8	47	2-8	7-1	60	4-3	+13	8-0	61	4-11	+14
	21	5-9	90	5-2	6-9	91	6-2	+ 1	7-7	86	6-6+	- 4
	22	6-10	67	4-7	7-4	59	4-4	- 8	8-2	77	6-3	+10
	23	5-11	59	3-6	6-11	60	4-2	+ 1	7-10	54	4-3	- 5
	24	6-2	80	4-11	6-7	89	5-10	+ 9	7-5	88	6-6+	+ 8
1961	25	6-0	68	4-1	7-3	85	6-2	+17	-	-	-	-
	26	6-0	72	4-4	6-11	75	5-2	+ 3	-	-	-	-
	27	5-6	64	3-6	7-0	65	4-7	+ 1	-	-	-	-
	28	6-3	52	3-3	7-4	57	4-2	+ 5	-	-	-	-
	29	5-10	84	4-11	6-5	79	5-1	- 5	-	-	-	-
	30	5-8	79	4-6	7-0	90	6-4	+11	-	-	-	-
	31	5-6	76	3-11	6-8	88	5-10	+12	-	-	-	-
	32	5-8	65	3-8	7-2	85	6-1	+20	-	-	-	-
	33	6-0	53	3-2	6-4	67	4-1	+14	-	-	-	-
Means		5-11	62	3-8	6-9	69	4-8	+ 6	8-7	62	5-4	- 1
(Higher Socio-economic group)												
1958	34	Test	-	-	6-4	46	2-11	-	9-1	67	6-1	+21
	35	Not	-	-	6-5	47	3-0	-	9-1	54	4-11	+ 7
	36	Used	-	-	6-6	49	3-2	-	9-3	65	6-2	+16
1959	37	6-8	61	4-1	7-1	67	4-9	+ 6	9-0	71	6-6	+10
	38	6-10	54	3-6	7-3	54	3-11	0	9-0	52	4-8	- 2
	39	6-0	53	3-2	7-1	52	3-8	- 1	8-9	47	4-1	- 6
	40	5-6	58	3-2	6-6	64	4-2	+ 6	Moved to Vermont			-
	41	6-3	43	2-8	7-3	72	5-3	+29	8-11	66	5-11	+23
	42	5-1	51	2-7	6-7	51	3-4	0	8-2	56	4-7	+ 5
	43	5-5	49	2-8	6-11	58	4-0	+ 9	-	-	-	-
1960	44	5-8	47	2-8	7-2	45	3-3	- 2	8-0	46	3-8	- 1
	45	5-5	58	3-2	6-10	66	4-6	+ 8	7-9	65	5-0	+ 7
	46	5-1	62	3-2	6-7	90	5-11	+28	7-7	86	6-6+	+24
	47	5-2	74	3-10	6-6	91	5-11	+17	7-5	88	6-6+	+14
	48	6-1	59	3-7	7-1	68	4-10	+ 9	7-11	69	5-6	+10
	49	5-5	58	3-2	6-10	66	4-6	+ 8	7-11	63	5-0	+ 5
	50	5-8	72	4-1	6-7	68	4-6	- 4	7-5	80	5-11	+ 8
1961	51	5-9	80	4-7	7-3	85	6-2	+ 5	-	-	-	-
	52	5-9	51	2-11	7-2	66	4-9	+15	-	-	-	-
	53	6-1	62	3-9	7-2	71	5-1	+ 9	-	-	-	-
	54	5-2	52	2-8	6-8	63	4-2	+11	-	-	-	-
Means		5-8	58	3-4	6-10	64	4-4	+ 9	8-4	65	5-5	+ 6
Total Means		5-10	60	3-6	6-10	67	4-7	+ 7	8-6	63	5-4	+ 3

2b. Merrill Palmer Test Results for Comparison Subjects, 1958-1961

Subjects	C.A., I.Q. and M.A.										
(Lower Socio-economic group)	First Test			Intermediate			I.Q. Changes	Final Test			Overall I.Q. Changes
	C.A.	I.Q.	M.A.	C.A.	I.Q.	M.A.		C.A.	I.Q.	M.A.	
C1	6-9	75	5-1	7-10	83	6-6†	+ 8	8-8	75	6-6†	0
C2	7-5	88	6-6	8-5	77	6-6†	-11	9-4	70	6-6†	-18
C3	8-2	76	6-2	9-0	71	6-5	- 5	9-9	67	6-6†	- 9
C4	8-7	70	6-1	9-7	64	6-1	- 6	10-6	59	6-2	-11
C5	8-0	54	4-4	8-10	55	4-10	+ 1	9-8	67	6-6†	+13
C6	7-4	85	6-3	8-3	79	6-6†	- 6	9-0	72	6-6†	-13
C7	9-0	70	6-4	9-9	61	5-11	- 9	10-10	60	6-6†	-10
C8	8-7	69	5-10	9-6	68	6-6†	- 1	8-7	69	5-10	0
C9	9-0	69	6-2	9-9	62	6-1	- 7	11-1	56	6-3	-13
C10	8-0	81	6-6	8-10	74	6-6†	- 7	9-9	67	6-6†	-14
C11	7-2	66	4-9	8-3	75	6-2	+ 9	10-0	51	5-1	-15
C12	7-11	42	3-4	NA	NA	NA	-	NT	NT	NT	-
C13	7-4	86	6-4	8-4	76	6-4	-10	9-3	70	6-6†	-16
C14	7-8	83	6-4	8-7	76	6-6†	- 7	9-6	68	6-6†	-15
C15	8-10	59	5-3	9-7	NT	NT	-	10-8	61	6-6†	+ 2
C16	8-6	75	6-4	9-7	67	6-5	- 8	10-5	62	6-6†	-13
Means	8-0	72	5-9	8-11	71	6-3	- 4	9-10	65	6-4	- 9
(Higher Socio-economic group)											
C17	8-8	66	5-9	9-6	50	4-9	-16	10-5	51	5-2	-15
C18	8-2	48	3-11	9-5	53	5-0	+ 5	10-1	52	5-3	+ 4
C19	7-8	50	3-10	NA	NA	NA	-	NA	NA	NA	-
C20	8-1	65	5-3	9-2	70	6-5	+ 5	10-0	65	6-6†	0
C21	8-0	52	4-2	9-1	64	5-10	+12	9-11	52	5-2	0
C22	7-5	52	3-10	8-6	42	3-7	-10	9-5	48	4-6	- 4
C23	8-6	60	5-1	NA	NA	NA	-	10-4	49	5-1	-11
C24	7-2	48	3-5	8-2	52	4-3	+ 4	9-0	54	4-10	+ 6
C25	7-5	60	4-5	8-4	56	4-8	- 4	9-3	59	5-6	- 1
C26	7-7	64	4-10	8-6	58	4-11	- 6	9.5	55	5-2	- 9
C27	8-8	75	6-6	9-10	66	6-6	- 9	10-7	61	6-6†	-14
C28	7-1	60	4-3	8-0	65	5-2	+ 5	9-0	72	6-6	+12
Means	7-10	58	4-7	8-10	58	5-1	- 1	9-9	56	5-6	- 3
Total Means	7-11	66	5-3	8-11	65	5-9	- 3	9-9	61	6-0	- 6

† indicates ceiling of Test reached

3a. Revised Columbia Mental Maturity Test Results for Experimental Subjects, 1958-1961

Subjects		C.A., I.Q. and M.A.										
(Lower Socio-economic group)		First Test			Exit Test			I.Q.	Last Follow-up			Overall
		C.A.	I.Q.	M.A.	C.A.	I.Q.	M.A.	Changes	C.A.	I.Q.	M.A.	I.Q. Changes
	1			-	6-6	67	4-4	-	-	-	-	-
	2			-	6-7	81	5-4	-	9-5	69	6-6	-12
	3			-	7-2	55	3-11	-	9-10	41	4-0	-14
1958	4			-	7-4	78	5-9	-	10-0	61	6-1	-17
	5			-	7-2	79	5-8	-	9-9	60	5-10	-19
	6			-	6-6	88	5-9	-	9-2	75	6-10	-13
	7			-	6-7	56	3-8	-	9-6	59	5-7	+ 3
	8			-	6-5	66	4-3	-	9-3	66	6-3	0
	9	6-5	83	5-4	6-10	84	5-9	+ 1	-	-	-	-
	10	5-11	65	3-10	6-10	56	3-10	- 9	8-7	60	5-2	- 5
	11	6-1	66	4-0	6-7	76	5-0	+10	8-4	66	5-6	0
1959	12	5-9	71	4-1	6-8	63	4-2	- 8	8-6	72	6-1	+ 1
	13	5-8	N.T.	N.T.	6-7	N.T.	N.T.	-	8-4	47	3-11	-
	14	6-3	65	4-1	6-5	64	4-1	- 1	8-2	68	5-7	+ 3
	15	5-9	70	4-0	6-8	55	3-8	-15	8-5	77	6-6	+ 7
	16	6-5	61	3-11	7-4	61	4-6	0	9-1	71	6-5	+10
	17	5-11	79	4-8	6-10	84	5-9	+ 5	7-9	80	6-2	+ 1
	18	5-8	N.T.	N.T.	7-1	49	3-6	-	8-1	N.T.	N.T.	-
	19	6-0	63	3-9	6-4	57	3-7	- 6	7-3	66	4-9	+ 3
1960	20	5-8	N.T.	N.T.	7-2	N.T.	N.T.	-	8-0	N.S.	N.S.	-
	21	6-3	95	5-11	6-9	83	5-7	-12	7-7	83	6-9	-12
	22	6-10	N.T.	N.T.	7-4	72	5-3	-	8-2	68	5-7	- 4
	23	5-11	N.T.	N.T.	6-11	58	4-0	-	7-10	N.S.	N.S.	-
	24	6-5	57	3-8	6-7	70	4-7	+13	7-5	66	4-11	+ 9
	25	6-4	76	4-10	7-3	83	6-0	+ 7	-	-	-	-
	26	6-5	73	4-8	6-11	73	5-1	0	-	-	-	-
	27	5-7	64	3-7	7-0	86	6-0	+22	-	-	-	-
	28	6-2	67	4-3	7-4	N.T.	N.T.	-	-	-	-	-
1961	29	5-10	71	4-2	6-5	79	5-1	+ 8	-	-	-	-
	30	5-11	66	3-11	7-0	82	5-9	+16	-	-	-	-
	31	5-6	74	4-1	6-8	91	6-1	+17	-	-	-	-
	32	6-1	88	5-4	7-2	80	5-9	- 8	-	-	-	-
	33	6-0	68	4-1	6-4	N.T.	N.T.	-	-	-	-	-
Means		6-0	71	4-4	6-10	72	4-11	-0.5	8-7	66	5-8	- 3
Higher Socio-economic group)												
	34	Revised Test Not			6-5	58	3-9	-	9-1	54	4-11	- 4
958	35				6-6	64	4-1	-	9-1	49	4-5	-15
	36	Available			6-7	59	3-11	-	9-3	51	4-10	- 8
	37	6-7	N.T.	N.T.	7-0	56	3-11	-	9-0	63	5-8	+ 7
	38	6-9	58	3-11	7-2	55	3-11	- 3	9-0	N.T.	N.T.	-
	39	6-1	64	3-11	7-0	57	4-0	- 7	8-8	57	4-11	- 7
959	40	5-7	76	4-3	6-6	94	6-1	+18	-	-	-	-
	41	6-9	56	3-9	7-3	64	4-8	+ 8	8-11	55	4-11	- 1
	42	5-7	72	4-0	6-6	60	3-11	-12	8-2	64	5-3	- 8
	43	5-10	N.T.	N.T.	6-10	N.T.	N.T.	-	-	-	-	-
	44	6-10	52	3-7	7-2	53	3-10	+ 1	8-0	56	4-6	+ 4
	45	5-11	68	4-0	6-10	63	4-4	- 5	7-9	49	3-10	-19
	46	5-7	104	5-10	6-8	90	6-0	-14	7-7	79	6-0	-25
960	47	5-5	77	4-2	6-6	94	6-1	+17	7-5	92	6-10	+15
	48	6-1	60	3-8	6-7	59	3-11	- 1	7-11	N.S.	N.S.	-
	49	5-5	72	3-11	6-10	77	5-3	+ 5	7-11	78	6-2	+ 6
	50	5-7	87	4-10	6-7	82	5-5	- 5	7-5	87	6-5	0
	51	6-3	69	4-4	7-3	34	2-6	-35	-	-	-	-
961	52	6-3	60	3-9	7-2	65	4-8	+ 5	-	-	-	-
	53	6-2	68	4-2	7-2	N.T.	N.T.	-	-	-	-	-
	54	5-9	81	4-8	6-8	80	5-4	- 1	-	-	-	-
leans		6-0	70	4-2	6-10	67	4-6	- 2	8-4	64	5-3	- 4
otal Means		6-0	71	4-3	6-10	70	4-9	-1.3	8-6	65	5-6	- 4

3b. Revised Columbia Mental Maturity Test Results for Comparison Subjects, 1958-1961

Subjects	C.A., I.Q. and M.A.										
	First Test			Intermediate			I.Q.	Final Test			Overall
(Lower Socio-economic group)	C.A.	I.Q.	M.A.	C.A.	I.Q.	M.A.	Changes	C.A.	I.Q.	M.A.	I.Q. Changes
C1	6-9	70	4-9	7-10	90	7-1	+20	8-8	70	6-1	0
C2	7-5	75	5-7	8-5	71	6-0	- 4	9-4	72	6-9	- 3
C3	8-2	70	5-9	9-0	62	5-7	- 8	9-10	66	6-6	- 4
C4	8-7	58	5-0	9-7	57	5-5	- 1	10-6	62	6-6	+ 4
C5	8-0	56	4-6	9-0	59	5-4	+ 3	9-8	57	5-6	+ 1
C6	7-4	77	5-8	8-3	66	5-5	-11	9-0	72	6-6	- 5
C7	9-0	65	5-10	9-10	69	6-10	+ 4	10-10	62	6-8	- 3
C8	8-7	54	4-8	9-6	71	6-9	+17	8-7	54	4-8	0
C9	9-0	58	5-3	9-10	65	6-5	+ 7	11-1	52	5-9	- 6
C10	8-0	77	6-2	8-10	90	7-11	+13	9-9	75	7-4	- 2
C11	7-2	48	3-5	8-3	47	3-11	- 1	10-0	52	5-2	+ 4
C12	7-10	N.T.	N.T.	N.T.	N.T.	N.T.	-	-	N.T.	-	-
C13	7-4	69	5-1	8-4	69	5-9	0	9-3	65	6-0	- 4
C14	7-8	76	5-10	8-7	68	5-10	- 8	9-6	68	6-5	- 8
C15	8-10	68	6-0	9-7	67	6-5	- 1	10-8	56	6-0	-12
C16	8-7	70	6-0	9-7	63	6-0	- 7	10-5	76	7-11	+ 6
Means	8-0	66	5-4	9-0	68	6-1	+1.5	9-10	64	6-3	- 2
(Higher Socio-economic group)											
C17	8-8	51	4-5	9-7	N.T.	N.T.	-	10-5	49	5-0	- 2
C18	8-2	43	3-7	9-5	42	3-11	- 1	10-1	52	5-3	+ 9
C19	7-8	61	4-8	-	N.A.	-	-	-	N.A.	-	-
C20	8-1	64	5-2	9-2	58	5-4	- 6	10-0	60	6-0	- 4
C21	8-0	64	5-1	9-1	56	5-1	- 8	9-11	55	5-6	- 9
C22	7-5	63	4-8	8-5	54	4-7	- 9	9-5	48	4-6	-15
C23	8-6	44	3-9	-	N.A.	-	-	10-4	55	5-8	+11
C24	7-2	57	4-1	8-2	47	3-10	-10	9-0	48	4-4	- 9
C25	7-5	63	4-8	8-4	56	4-8	- 7	9-4	54	5-1	- 9
C26	7-7	66	5-0	8-5	60	5-1	- 6	9-5	56	5-3	-10
C27	8-10	64	6-0	9-10	64	6-4	0	10-7	71	7-6	+ 7
C28	7-1	52	3-8	8-0	49	3-11	- 3	9-0	56	5-1	+ 4
Means	8-0	58	4-7	8-10	54	4-9	-5.5	9-9	53	5-5	- 2
Total Means	8-0	62	5-0	8-11	62	5-7	-2.0	9-10	60	5-11	- 2

4a. Academic Readiness Test Results for Experimental Subjects

1958 - 1961

Subjects	Stanford-Binet		Laterality			Cutting (Maximum Score 6)			Color: Pointing (7 possible)			Color: Naming (7 possible)			Color: Matching (24 possible)		
(Lower Socio-economic group)		I.Q. at Entrance	First Test	Exit Test	Last Follow-up	First Test	Exit Test	Last Follow-up	First	Exit	Last Follow-up	First	Exit	Last Follow-up	First	Exit	Last Follow-up
10	I.Q. under 50	39	M	M	L	0	0	0	0	2	2	0	0	5	0	11	24
13		44	L	M	M	0	0	1	0	1	0	0	3	0	0	0	0
20		48	M	M	L	0	0	0	0	2	4	0	4	4	2	24	17
3	I.Q. 50 - 59	50	M	M	R	*	0	0	*	2	5	*	N.T.	6	*	1	24
6		52	M	M	M	*	2	4	*	7	6	*	N.T.	7	*	24	24
7		53	R	R	M	*	0	1	*	2	3	*	2	4	*	23	23
12		50	M	M	M	0	0	2	1	3	7	0	6	0	0	22	24
14		58	M	M	M	1	0	0	2	2	3	1	N.T.	5	21	15	21
15		57	M	M	M	0	0	0	6	4	7	N.T.	5	0	0	8	22
16		54	M	R	R	0	0	4	5	7	7	0	0	0	0	24	24
18		51	M	M	M	0	0	0	2	2	4	0	7	5	0	6	3
19		53	M	M	M	0	0	0	0	2	0	0	2	4	22	24	22
26		59	M	M	-***	0	0	-	6	3	-	6	7	-	24	24	-
27		51	M	M	-	0	0	-	0	7	-	0	0	-	21	24	-
28		52	R	M	-	2	0	-	0	3	-	2	6	-	17	24	-
2	I.Q. 60 - 69	66	M	N.A.*	R	*	-	5	*	6	7	*	N.T.	0	*	24	24
4		69	M	M	R	*	4	5	*	5	7	*	6	0	*	24	23
5		61	M	M	R	*	5	4	*	5	6	*	N.T.	7	*	20	24
8		63	M	M	M	*	5	5	*	1	7	*	0	0	*	24	24
9		66	M	M	M	0	1	6**	5	7	7**	N.T.	6	N.A.	11	24	24*
11		61	M	M	M	0	0	2	7	6	6	0	N.T.	7	24	24	24
22		68	M	R	M	0	0	1	5	7	7	7	0	0	24	24	24
23		60	M	R	M	0	0	0	1	2	4	1	2	4	0	13	23
24		69	M	R	R	1	0	5	6	7	6	N.T.	0	7	23	24	24
25		60	M	M	-	0	4	-	2	7	-	3	0	-	8	24	-
31		61	R	M	-	0	1	-	0	7	-	2	0	-	24	24	-
32		63	M	R	-	2	4	-	1	7	-	N.T.	0	-	23	20	-
33		61	R	M	-	0	0	-	0	1	-	5	6	-	13	8	-
17	I.Q. 70-75	72	M	M	M	0	0	5	3	3	6	5	6	7	20	20	24
21		73	M	M	M	0	1	4	2	5	7	2	5	0	24	23	24
29		70	R	M	-	1	0	-	6	6	-	3	7	-	24	24	-
30		73	R	M	-	0	4	-	0	7	-	1	0	-	20	24	-
1		N.S.	M	M	N.A.	N.T.	N.T.	N.A.	*	1	N.A.	*	7	N.A.	*	24	N.A.

(Higher Socio-
economic group)

42	I.Q. -50	48	M	M	M	0	0	2	0	3	7	0	3	0	0	22	23
43		40	M	M	M	0	3	N.A.	0	5	N.A.	0	5	N.A.	0	24	N.A.
34	I.Q. 50 - 59	51	R	R	M	*	0	2	*	7	7	*	0	0	*	8	24
35		50	M	M	M	*	0	1	*	0	6	*	0	0	*	0	17
36		59	M	M	M	*	4	5	*	2	5	*	0	6	*	1	22
37		55	M	M	M	0	0	4	1	6	7	N.T.	5	0	18	24	24
38		58	M	M	M	0	0	N.T.	0	3	0	0	4	0	0	0	0
39		56	M	M	M	0	0	4	4	7	4	0	0	0	8	21	24
44		52	M	M	M	0	0	0	5	5	7	7	7	0	16	24	22
46		58	M	M	M	0	5	5	1	7	6	6	0	6	8	22	24
47		56	M	M	L	0	0	5	6	7	6	1	0	7	16	24	24
51		57	M	M	-	4	4	-	2	4	-	0	4	-	18	24	-
52		57	M	R	-	0	0	-	2	6	-	0	7	-	0	24	-
54		59	M	M	-	0	0	-	2	0	-	0	3	-	2	24	-
41	I.Q. 60-69	63	M	M	N.T.	0	0	5	7	6	4	0	6	0	0	0	13
45		62	R	R	M	0	0	2	0	1	2	1	2	0	4	21	21
48		60	M	M	M	0	0	0	0	2	1	2	2	4	0	15	18
49		60	M	M	M	0	0	0	2	7	5	2	0	7	17	23	24
53		61	M	M	-	0	0	-	0	1	-	0	3	-	24	23	-
40	I.Q. 70-75	72	M	M	-	0	0	N.A.	6	5	N.A.	N.T.	6	N.A.	24	22	N.A.
50		74	M	M	M	1	0	4	2	5	7	5	6	0	24	22	24

*Test not in use during first half of first Project year
**Child not available for last follow-up and score given is for test preceding last
***(-) in follow-up spaces indicates a 1961 class member, not followed.

N.A. not available for testing
N.S. test could not be scored
N.T. not testable at time scheduled

4b. Academic Readiness Test Results for Comparison Subjects, 1958 - 1961

Subjects (Lower Socio-economic group)	S.B. Range	I.Q.'s at Entrance	Laterality 1st	Laterality 2nd	Laterality 3rd	(Cutting (6 possible) 1st	Cutting 2nd	Cutting 3rd	Pointing (7 possible) 1	Pointing 2	Pointing 3	Color Naming (7 possible) 1	Color Naming 2	Color Naming 3	Matching (24 possible) 1	Matching 2	Matching 3
C5	I.Q. 50-59	53	M	R	L	0	1	5	7	7	7	4	7	6	24	24	23
C9		54	R	R	R	0	2	5	7	6	6	6	4	7	24	24	24
C12		51	R	R	R	0	N.A.	3	1	N.A.	0	0	N.A.	4	24	N.A.	24
C4	I.Q. 60 - 69	62	M	R	R	2	5	5	5	6	7	3	6	7	24	24	24
C6		65	R	M	R	5	5	5	5	7	7	3	4	6	24	24	24
C7		67	R	R	R	1	1	4	7	7	7	6	5	7	24	24	23
C10		69	R	R	R	5	5	5	4	6	7	2	5	6	N.A.	24	24
C11		68	M	M	R	2	4	5	4	6	7	2	4	5	24	22	24
C13		67	M	M	M	5	5	5	7	7	7	6	7	7	24	24	24
C14		67	R	R	R	5	5	5	5	7	7	3	5	6	24	24	24
C15		66	L	R	M	5	5	2	5	7	7	3	5	7	24	24	24
C16		68	M	R	R	5	5	5	7	7	7	6	7	7	24	22	24
C1	I.Q. 70-75	74	M	M	R	3	5	4	4	7	6	2	3	5	21	23	22
C2		75	L	L	L	5	5	5	3	6	7	1	3	6	24	24	24
C3		74	R	R	R	5	5	5	5	6	7	4	3	6	24	24	24
C8		73	R	R	R	5	5	5	6	7	7	4	7	7	24	24	24
(Higher Socio-economic group)																	
C18	I.Q. under 50	44	R	R	R	0	2	5	7	7	7	6	7	7	23	24	24
C17		57	M	R	M	0	0	2	0	2	3	0	0	2	23	20	24
C21		58	R	M	R	4	2	5	6	7	7	4	4	5	22	24	24
C22		56	M	M	M	0	0	1	6	7	6	3	6	5	24	24	24
C24		57	M	M	R	0	0	4	6	6	5	3	6	6	24	24	24
C19	I.Q. 60-69	62	R	N.A.	N.A.	0	N.A.	N.A.	6	N.A.	N.A.	4	N.A.	N.A.	23	N.A.	N.A.
C20		66	R	R	R	3	3	5	5	6	4	3	5	6	24	24	24
C23		60	R	M	M	4	5	5	7	7	7	6	7	7	24	24	24
C25		68	M	L	M	0	0	3	5	5	6	2	7	6	21	24	23
C26		62	M	R	R	0	1	4	5	6	7	3	6	6	22	20	24
C28		63	M	M	M	0	0	3	7	7	7	5	7	7	21	24	24
C27	I.Q. 70-75	73	R	R	R	5	5	5	7	7	7	6	7	7	24	24	24

N.A. not available for testing.

5a. Speech and Language Test Results for Experimental Subjects, 1958-1961

Subjects		Peabody Picture Vocabulary Test (A)				Mecham Verbal Language Development				Templin Pre-School Discrimination			
			(Vocabulary Age)				(Language Age)						
(Lower socio-economic group	Entrance C.A.	First	Exit	Final	Gain	First	Exit	Final	Gain	First	Exit	Final	Gain
1	5-10	This test bat-	State Institution			This test	State Institution			This test	State Institution		
2	5-11	battery not	N.A.	5-8		battery not	N.A.	6-5		battery not	N.A.	54	
3	4-6	in use until	3-5*	5-8		in use until	3-4*	3-9		in use until	49*	56	
4	6-10	end of 1st	5-0*	8-9		end of 1st	4-0*	8-5		end of 1st	46*	55	
5	6-8	project	5-0*	7-6		project	6-5*	5-6		project	51*	55	
6	6-0	year	3-6*	5-6		year	4-0*	7-5		year	51*	54	
7	6-0		3-3*	5-2			3-0*	3-5			43*	53	
8	5-9		4-1*	5-8			4-6*	6-3			46*	55	
9	6-4	2-11	3-7	State Institution		3-0	3-2	State Institution		39	47	State Institution	
10	5-3	(-)2-6	(-)2-6	(-)2-6		2-2	2-4	3-8		41	41	47	
11	5-11	4-9	6-8	8-9		3-8	4-0	6-3		37	38	39	
12	5-1	(-)2-6	2-11	4-3		2-4	2-4	3-6		47	49	51	
13	5-0	(-)2-6	(-)2-6	(-)2-6		1-3	1-4	1-6		39	42	43	
14	6-4	(-)2-6	3-0	3-8		3-2	3-2	3-8		39	44	39	
15	5-1	3-5	5-4	8-7		3-2	3-2	4-1		50	50	52	
16	5-9	3-7	4-1	6-6		2-9	3-2	6-3		46	49	56	
17	5-11	4-6	6-1	5-8		3-8	4-4	7-0		56	55	58	
18	5-6	(-)2-6	3-1	2-7		3-1	3-0	3-1		35	45	47	
19	4-11	2-7	3-5	3-9		1-4	3-0	3-4		41	50	49	
20	5-7	3-1	3-6	4-11		2-1	3-0	3-4		43	47	47	
21	5-8	3-3	10-8	8-1		2-8	4-6	4-1		47	53	53	
22	6-4	4-8	5-2	6-10		3-2	6-1	4-1		57	55	55	
23	5-9	4-0	4-9	6-1		3-4	3-5	3-8		53	54	54	
24	6-1	(-)2-6	3-6	3-11		3-6	4-6	5-8		46	48	51	
25	5-11	(-)2-6	4-8	-		2-1	2-6	-		46	49	-	
26	5-11	(-)2-6	2-6	-		3-2	2-9	-		42	47	-	
27	5-5	(-)2-6	3-3	-		3-0	3-0	-		36	49	-	
28	5-11	(-)2-6	2-11	-		3-0	2-9	-		41	45	-	
29	5-6	3-1	3-6	-		3-3	4-0	-		35	43	-	
30	5-7	2-8	5-8	-		3-0	5-8	-		49	54	-	
31	5-3	(-)2-6	3-2	-		2-6	4-1	-		46	52	-	
32	5-8	(-)2-6	4-10	-		2-8	4-5	-		40	51	-	
33	5-7	2-8	2-2	-		3-2	3-4	-		42	46	-	
Means	5-9	3-0	4-1	5-7		2-7	3-6	4-6		45	49	52	
N		25	31	22		25	31	22		25	31	22	

5a. Speech and Language Test Results for Experimental Subjects, 1958-1961 (Cont.)

Subjects		Peabody Picture Vocabulary Test (A)				Mecham Verbal Language Development				Templin Pre-School Discrimination			
(Higher socio-economic group	Entrance C.A.		(Vocabulary Age)				(Language Age)						
		First	Exit	Final	Gain	First	Exit	Final	Gain	First	Exit	Final	Gain
34	6-3	Tests	3-6*	8-1		Tests	3-4*	6-6		Tests	50*	57	
35	5-10	not in	3-2*	6-6		not in	3-8*	4-0		not in	53*	54	
36	5-10	use	3-3*	5-0		use	3-6*	3-8		use	47*	48	
37	6-7	(-)2-6	3-7	6-10		3-0	3-0	5-0		46	48	59	
38	6-7	5-0	5-2	6-8		3-2	3-2	3-6		50	51	57	
39	5-10	3-2	3-6	6-6		3-8	3-8	4-6		48	52	51	
40	4-10	4-8	5-6	Not in N.Y.State		3-8	4-0	Not in N.Y.State		53	58	Not in N.Y.Stat	
41	5-9	3-3	3-7	6-3		3-4	3-8	4-0		51	56	55	
42	5-0	3-11	4-8	5-4		1-4	1-4	4-6		47	52	54	
43	5-3	(-)2-6	(-)2-6	Not in school		1-4	1-4	Not in school		44	49	Not in school	
44	5-8	2-8	3-0	3-7		3-8	3-8	4-0		45	53	52	
45	5-1	3-8	5-0	3-0		3-0	3-8	4-0		45	54	52	
46	5-0	3-5	4-10	6-10		2-0	5-8	6-6		43	56	55	
47	5-1	(-)2-6	3-11	5-0		3-8	5-2	7-2		50	56	58	
48	6-1	3-4	4-9	4-6		2-8	3-7	3-2		49	51	52	
49	5-3	4-8	7-6	5-6		3-2	3-6	3-7		48	56	56	
50	5-7	2-10	4-9	5-0		3-0	4-0	5-3		49	52	54	
51	5-0	2-11	4-3	-		2-0	3-9	-		45	51	-	
52	5-4	3-5	6-8	-		3-2	4-1	-		46	51	-	
53	6-0	(-)2-6	4-3	-		3-2	2-8	-		44	51	-	
54	5-1	2-11	4-10	-		2-5	3-4	-		46	46	-	
Means	5-7	3-4	4-5	5-10		2-9	3-6	4-7		47	52	54	
Total Means	5-8	3-2	4-3	5-8		2-9	3-6	4-7		46	50	53	

* These scores are those for the first follow up after exit, since this test battery was not available and is included here as having similar weight when administered in the Fall to that for a preceding June. The time interval between this "exit" score and the final score is 3 years.

5a. Speech and Language Test Results for Comparison Subjects, 1958-1961

(Lower Socio-economic group	(Initial testing)	Peabody First	(Vocabulary Age) Inter-mediate	Final	Mecham First	(Language Age) Inter-mediate	Final	First	Templin Inter-mediate	Final
C1	6-6	3-6	6-10	8-1	3-6	5-2	5-0	52	56	57
C2	7-4	5-2	5-2	5-4	3-6	6-3	7-0	50	53	53
C3	7-11	4-1	4-9	6-10	3-7	5-0	5-0	50	53	55
C4	8-6	3-1	3-11	4-2	3-2	5-1	5-1	46	50	48
C5	8-0	(-)2-6	3-0	4-10	3-4	5-5	6-2	50	53	56
C6	7-4	4-5	5-2	5-6	3-5	4-8	5-2	52	55	53
C7	9-0	4-10	5-9	6-1	4-0	5-7	6-0	43	50	54
C8	8-5	5-2	6-6	6-6	4-3	6-2	6-3	55	57	53
C9	9-0	4-5	5-6	7-1	5-3	4-0	5-5	50	51	53
C10	8-0	3-9	4-8	5-8	3-8	6-6	6-5	53	55	55
C11	7-2	2-11	5-0	6-6	3-2	5-0	4-5	48	54	56
C12	7-10	3-2	N.A.	7-3	3-0	N.A.	3-4	46	N.A.	49
C13	7-4	3-11	4-8	5-2	3-4	6-5	7-0	51	56	56
C14	7-8	4-0	5-11	6-3	3-2	5-2	5-6	51	54	54
C15	8-9	3-9	4-5	4-10	4-3	5-5	6-1	42	54	55
C16	8-6	4-6	4-8	4-11	3-8	6-2	6-5	49	51	53
Means	8-0	4-0	5-1	5-11	3-8	5-6	5-8	49	53	54
(Higher socio-economic group)										
C17	8-8	7-1	9-6	6-10	2-8	2-8	3-5	53	56	56
C18	8-2	(-)2-6	3-0	3-9	3-0	5-2	4-6	44	49	50
C19	7-10	5-6	N.A.	N.A.	3-6	N.A.	N.A.	57	N.A.	N.A.
C20	7-0	5-2	6-6	6-6	3-3	4-0	5-8	53	57	55
C21	8-0	3-7	4-6	4-10	4-3	4-3	5-1	51	52	52
C22	7-4	2-8	4-8	4-8	3-0	2-9	3-9	51	49	52
C23	8-7	2-11	3-10	5-4	4-0	5-2	6-7	51	52	54
C24	7-0	4-5	5-8	6-3	3-5	4-3	6-5	49	52	54
C25	7-3	6-6	8-9	7-6	3-8	3-5	4-6	55	57	58
C26	7-6	3-1	7-1	6-8	3-8	4-6	5-6	51	56	56
C27	8-8	6-8	7-1	6-10	7-0	7-7	7-5	56	58	58
C28	7-0	2-9	5-8	8-3	3-4	4-5	5-2	44	59	50
Means	7-9	4-5	6-0	6-2	3-9	4-5	5-3	51	54	55
Total Means	7-10	4-2	5-6	6-0	3-9	5-0	5-6	50	54	54

6. Results Obtained for Experimental Subjects on Wide Range Achievement Tests in Relation to M.A., Race, Sex, Days in Project Classes and Socio-Economic Levels, 1961

Subjects (Lower Socio-Economic Group)				Mental Ages (Stanford-Binet)			Project Attendance	Wide Range Achievement (December 1961)		
		Race	Sex	Entrance	Exit	1960 Follow-up	No. Days in Class	Spelling	Oral Arith.	Reading
1958	1	W	M	N.S.	4-2	-	145	State Residential Institution		
	2	W	M	3-11	4-6	6-8	89	1.6	1.2	1.9
	3	W	F	3-5	3-8	4-4	106	0.0	0.4	0.0
	4	W	M	4-8	5-3	7-4	103	Left United States		
	5	N	M	4-0	5-3	7-2	110	1.0	1.6	1.6
	6	N	M	3-1	3-10	6-4	108	Public school cannot locate		
	7	W	M	3-2	3-10	4-0	89	Left New York City		
	8	W	M	3-9	4-3	6-11	112	2.6	2.0	3.1
1959	9	N	M	3-11	4-10	-	121	State Residential Institution		
	10	W	F	2-2	2-9	4-1	236	0.0	0.3	0.0
	11	W	M	3-5	5-2	5-10	129	2.5	1.6	4.0
	12	N	F	2-6	3-6	4-6	204	Not in school		
	13	W	M	2-5	3-4	2-10	249	0.1	0.2	0.0
	14	N	F	3-5	4-4	4-11	77	1.0	1.0	1.1
	15	W	M	3-0	4-9	4-10	283	1.0	0.7	1.2
	16	W	M	3-2	4-6	5-9	229	1.3	2.0	1.8
1960	17	W	M	4-2	5-6	5-6	122	1.7	1.8	3.2
	18	W	M	2-9	2-9	3-6	264	0.0	0.7	1.2
	19	N	M	2-7	3-0	4-0	233	0.0	0.7	0.3
	20	W	M	2-7	4-0	3-11	238	Not in school		
	21	N	F	4-1	5-5	6-2	136	1.7	1.4	1.8
	22	N	F	4-3	5-2	6-3	142	Left N.Y. State		
	23	W	F	3-4	4-6	4-7	136	0.0	0.6	0.9
	24	N	F	3-11	5-0	6-0	112	1.3	1.5	1.1
1961	25	W	F	3-6	5-2	-	273	0.7	0.3	0.7
	26	N	F	3-5	4-7	-	191-1/2	1.0	1.2	1.2
	27	N	F	2-7	4-6	-	204	0.0	0.9	0.5
	28	N	M	3-1	4-0	-	230	0.3	0.2	0.3
	29	N	M	3-10	4-4	-	163	0.0	1.0	1.1
	30	N	F	4-0	5-10	-	255	Public school cannot locate		
	31	N	F	3-2	5-6	-	190-1/2	Public school cannot locate		
	32	N	M	3-6	5-2	-	250	1.0	1.1	1.2
	33	W	M	3-5	4-11	-	142	Not in school		
Means		N=16 W=17	M=20 F=13	3-5	4-5	5-4	176	1.0	1.0	1.3
(Higher Socio-Economic Group)										
1958	34	W	M	3-1	3-3	5-10	87	2.0	1.4	1.8
	35	W	F	2-11	3-6	5-1	123	1.5	1.0	1.8
	36	N	M	3-6	3-7	5-0	120	1.0	1.0	1.3
1959	37	W	F	3-6	4-4	5-4	104	Left New York City		
	38	W	M	3-6	3-10	4-8	104	0.0	0.3	0.0
	39	W	F	3-3	4-0	5-0	147	1.9	1.5	2.6
	40	W	F	3-7	5-3	-	263	Left New York State		
	41	W	M	3-9	4-10	6-5	224	1.6	1.2	1.4
	42	W	F	2-6	3-0	5-0	264	2.2	1.2	2.0
	43	N	M	2-4	3-0	-	274	Not in school		
1960	44	W	F	2-9	4-2	4-10	256	0.0	1.2	0.9
	45	W	M	3-1	4-6	5-1	290	Unable to locate		
	46	N	M	2-11	6-1	6-0	204	3.8	2.0	4.5
	47	W	F	2-11	5-9	6-6	206	2.8	1.8	4.0
	48	W	F	3-7	4-1	4-6	146	1.2	1.5	1.3
	49	W	M	2-11	4-9	4-9	286	0.0	0.6	1.2
	50	W	F	4-1	4-11	5-8	169	1.2	1.5	1.3
1961	51	W	F	2-10	4-7	-	224	1.0	0.2	1.1
	52	W	M	3-0	4-9	-	244	0.0	0.9	0.0
	53	W	F	3-8	4-2	-	149	0.8	0.7	0.9
	54	W	M	2-8	4-2	-	166	0.0	0.0	0.0
Means		N=3 W=18	M=10 F=11	3-2	4-4	5-4	191	1.2	1.1	1.5
Total Means				3-3	4-5	5-4	182	1.1	1.0	1.3

APPENDIX D

AN ANALYSIS OF THE SOCIAL INTERACTION OF A GROUP OF EDUCABLE MENTALLY RETARDED CHILDREN

by

Charles C. Bovee

Working Paper No. 1
December 15, 1958

(These working papers are intended primarily as informal research communications to and among members of the research staff. They may contain hypotheses, study proposals, reports of a study, critiques, etc., at any stage of refinement.)

AN ANALYSIS OF THE SOCIAL INTERACTION OF A GROUP OF EDUCABLE MENTALLY RETARDED CHILDREN

Introduction

The purpose of the Mental Retardation Project is to determine the effectiveness of nursery school classroom experience on the future school adjustment for a group of educable mentally retarded children. There are two age groupings in the Project, younger children from 4 years 9 months to 5 years 9 months, and the older group from 5 years 9 months to 6 years 9 months. All of the children for this research come from New York City and, at the close oftheir school experience at Teachers College, will enter the classes for Children with Retarded Mental Development in the New York City Public School System. In the present Project school program, the children are divided in two groups, the older ones attend the morning class and the younger students in the afternoon group. Each class meets five days a week for 2½ hours a day.

Problem

The observations are made by two observers, one for the morning group and one for the afternoon, usually from a one-way vision room and sometimes from within the group in activities such as those on the roof playground or during walks. The records include descriptions of various forms of behavior, such as, motor and manipulative, language, conceptualization and how these children react to their environment. There has been an increased effort during the current year, 1958, to determine the types and amount of social interaction of these children. Diary records have been made on the children which provide, to some degree, a qualitative view of their level of social ability. These Diary records are taken on Monday, Wednesday and Friday. On Tuesday and Thursday experimentation has taken place to develop a sociometric technique that will provide a picture of the group interaction. Underlying the technique used was the theory that by counting the number of social contacts, both those of a self-initiated variety and those initiated by child to child and by adults, one would get a general picture of the social interaction of this group. It is recognized that a quantitative account does not give the quality of these interactions, and the quality of associations is a vital necessity if one is to assess the real level of social ability. However, it was felt that a combination of the two, the Diary record plus the quantitative one would give a more reliable picture than either one separately. This report primarily considers the quantitative approach.

Out of this experimentation grew the idea of comparing this mentally retarded group with a normal group of children of similar chronological ages. There were several reasons for this. Some rather reliable guesses can be made as to the differences between the Project subjects and the so called normal, but there have been no actual comparisons. Secondly, it becomes difficult in observing these mentally retarded children to keep the proper perspective as to their actual level of ability. Consequently, it seemed a valuable experience for the observer to spend time observing in two groups concurrently in order to have a more adequate perspective. There have been a number of questions raised as to whether or not the development of the retarded child follows the same general pattern as for the normal, having only a quantitative difference, or whether there is a qualitative difference as well in his development. This is another reason for observing these two groups simultaneously; to see whether any clues might be found that will help in understanding the problem.

With these ideas in mind a project was proposed to make a quantitative analysis of 13 children in the 5-9 to 6-9 age group of mentally retarded, and to make a similar analysis of 13 children in the same age group in the Agnes Russell Center, an elementary school for now disabled children. Each child was to be observed for two half hour periods, making a total observation time of 13 hours for each group. Three basic questions were asked. First, what is the level of social ability as determined by the amount of contacts of each child in the mentally retarded group? Second, what is the interaction patterns of this group? Third, how does the mentally retarded group compare quantitatively with the group in the Agnes Russell Center? The teachers in charge of the classroom at the Agnes Russell Center not only gave their permission for obtaining the data but were extremely cooperative.

There are other more specific questions relating to the above basic ones that can be asked regarding these observations. How does each child stand with regard to the amount of contacts he makes with the teachers? What is the initiation pattern of each child? Does he initiate more contacts with other children or adults, or do they initiate more contacts toward him? How does the individual stand within the group? Is he an isolate or is he average or high in the number of contacts he makes? How many different children does he contact during the period of observation? How persistent are his contacts with those individuals with whome he makes contacts?

There are also specific questions to be raised in comparing the two groups of mentally retarded and normal children. What is the difference in the methods used in their child-child contacts? How do they compare in the number of child-child contact and in child-adult contacts? What is the difference between the two groups in the number of self-initiated contacts? What is the difference between the number of other-initiated contacts, especially in terms of the adults?

Description of the groups

The chronological age for the older group is from 5 years 9 months to 6 years 9 months, with the average age for the group at the time of this study being 6 years 4 months. The intelligence level based on the Stanford-Binet, Form L, is a range of 50 to 75, with the average being 58 points.

The Agnes Russell Center participants had an average age that was 8 months younger than the Project group with a mean age of 5 years 6 months and a range from 4 years 11 months to 5 years 10 months, although it was originally planned that the range of this group would be from 5 years 9 months to 6 years 9 months. Their actual age places them in the range of the younger mentally retarded group.

Method

The method used in this study is depicted on Charts I and II. The first is a representation of the "Tally Sheet" used for the Mental Retardation Project. Across the top of the page are the column headings for the possible people each child can contact. On the lefthand side are listed the names of each of the 13 children. There were two such charts as the observations were made at two different times, and two different days. Each day's observations consisted of a half hour of time. A different time of day was picked for the second observation period on each child. The time and date of the observations were recorded on the far right hand columns.

During the observation period a tally was marked for each social contact. A contact was considered to be an advance of a child toward another person. This could be verbal, physical or a definite facial expression such as a smile that could be clearly observed. If a child initiated a contact towards another person, and that person responded it was tabulated as only one contact for the child who initiated the association. However, if the child who was contacted made a further contact towards the first individual that was not in direct response to the first approach it was tallied as an initiated contact for the second individual. Thus the contacts are labeled "SI" for self-initiated and "OI" for other-initiated and appropriate rows for each child are provided on the chart. This method has its problems. It certainly cuts down on the reliability because the observer has to determine some very fine gradations as to what really constitutes a contact and from whom. In practice this was not too difficult a job with the mentally retarded children because so many of their contacts were clipped, being performed as one distinct behavior, followed by a brief response from the child contacted; then the association was broken. Consequently, it made it much easier to differentiate the contacts. This procedure became extremely difficult, however, with the normal child. The contacts took place so fast and the interchanges were so often overlapped that it was hard to determine accurately how many contacts occurred. Obviously the results from this method can only yield a general picture, and the method would have to be perfected before a complete study and analysis could be made.

One of the factors that facilitated the observations at the Agnes Russell Center was that the method used was a simplified version of the one used in the Mental Retardation Project, since a comparison and count was not being made between the Agnes Russell children to determine their interaction pattern. (See form used in Chart II.) Not having to keep a tally of individual children contacted, the observer had more time to distinguish between the "SI" and "OI" contacts. On the extreme right side was a place for notes to give some information as to the environment and quality of contacts. On the left, as on the Mentally Retarded Observation Chart, were two rows for self-initiated and other-initiated contacts. The time and date were recorded under the symbol for each child observed. There were 21 children in the normal group, but only 13 of them were used to compare with the mentally retarded children. The observer did not know any of the children and picked 9 boys and 4 girls for the representative group from Agnes Russell. There were 9 boys and 4 girls in the group of 13 from the Mental Retardation Project. The choice of children was primarily one of picking a who was accessible in the room at the particular time when the observations began.

As a quick check on how the results of this method would compare with another form of evaluation, the teachers were asked to rate the children. The teacher of the normal group was asked to rank only the boys to make the check in her group. The boys were listed separately on 3 x 5 cards and she was asked to place those she felt would be high in the number of contacts, not quality of contacts, in one stack. She was then asked to put those that were low in another and relegate the remainder to the middle group. Seven out of nine of these rankings corresponded generally with the ranking by the observational method. In the mentally retarded group this consistency was not found. The teachers were instructed in the same way and then the rankings for these two teachers were averaged together. They picked 4 out of 5 who were shown high on the observations and picked 3 out of 5 of the low ones, and 1 out of 3 who were in the middle group. This means that the two rankings by teachers and observers in this group compared favorably in 8 out of 13 cases. It might be anticipated that the teachers in this latter group would have more difficulty in ranking the children because the range for these 13 was much more restricted in the number of contacts made.

It should be stressed that a high number of contacts does,not necessarily mean a good quality of social interaction. In asking the teachers to note the quality of each child's contacts, some of those who were high in number were low in quality. And some of those who were low in number were high in quality. This had to be kept constantly in mind so as not to imply that quanity of contacts is the main factor in social adjustment.

Results

Table I is a compilation of an hour's observation for each child. Each child's horizontal line, designated as "SI", shows the number of self-initiated contacts each child makes to each teacher and to each child. The row marked "OI" gives the number of contacts made by others to the child. For each child studied, it was determined how many people had been contacted and with whom most of the contacts were made. At a glance, this tabulation shows whether there are more contacts with children or with adults. These numbers are limited in meaning without the qualitative descriptions included in the Diary records, but there are some assumptions that can be made and it is hoped that in the future, with additional records, it can be determined in which direction the social growth of each individual is developing. By adding the vertical columns under each child, a picture of interaction over an extended period of time can be determined. Table II gives a relationship between the two records, comparing the totals across with the totals down in terms of child-child interactions. In looking at this chart, there seems to be a greater consistency among the self-initiated contacts noted here than among contacts made by others toward each child.

A detailed analysis of each child has not been made in this report, but the individual evaluation is given for illustrative purposes. "Ti" is the subject used for this purpose. The observer was surprised to find so few contacts in this particular record for, he would have expected a much higher rating here in the amount of interaction. It can be seen in Table III that during this hour "Ti" had a great deal more contact with teachers than with children. The majority of the contacts with adults were initiated by the teachers. It would appear from looking at this record that "Ti" needed to be drawn into activity and did not take much initiative in entering into her environment. In comparing the diary record on "Ti", it was noted that she spent much of her time sitting and watching and did not enter into an activity quickly. The contacts she did make were often of a comforting nature, such as, hugging and kissing a child to console him. It may have been the nature of her contacts that caused the observer to feel that she would have more than the record actually showed. Knowing this picture could help the staff to look for ways to assist this child in developing social interactions.

A condensed version of Table III A is found in Table III B, in which each child is listed with a comparison of child-child "SI" and "OI", and child-adult "SI" and "OI." The purpose of using such a method could be its practical help in furthering an awareness of the areas that need to be watched in order to assist the social development of each child.

By counting contacts scored both across and down on Table I, the number of individuals contacted by a given child can be determined. For illustration and again using the child "Ti," it can be seen that she has contacts with 5 out of the 13 children but only 3 contacts were self initiated. By counting down under "Ti" over a period of time she only contacted 2 people. On the other hand, "To" had contact with 8 children in a one hour period. Over a period of time, he had contact with 10 children out of 13. By looking at the volume of numbers for each child, one can see also which one member in the group appeared to be most closely associated with any other individual. For example, with "To" this seemed to be "Di," and the diary records bore this out with remarkable clarity.

The interaction of the children as a group has already been described to some degree. Another picture is given when they are ranked in the various categories from the highest to the lowest. This is shown in Table V. There seems to be a consistency among those who are high and those who are low. One interesting picture was revealed by comparing children low in the child-child contacts with the child-adult contacts. It was noticed, however, that a good number of the contacts with the teacher were teacher initiated. One would expect that those who made a number of contacts would also receive a number of contacts. This is noticed in the diary record where one observes that the active ones who are high in social contacts often engage in a closer relationship with other individuals who rank high and cooperate in this type of behavior.

Table IV gives a picture of the contacts of the various individuals in the Agnes Russell Center. The children listed are from B_1 (Boy 1) to B_9 (Boy 9) and from G_1 (Girl 1) to G_4 (Girl 4). It has been seen that the ranges for this group as compared with the retarded are quite different. (The means of the various categories and the ranges are in Table VII.)

The mean of the Agnes Russell class is almost twice as large as for the mentally retarded group. This is what one might expect since communication greatly facilitates social contact. This was one of the outstanding impressions received in making these two sets of observations. How much of the normal group social interaction is dependent upon communication skill was not determined, but this factor was quite noticeable as the children initiated social relationships across a wide area by calling to one another and by suggesting futher ways of adapting their play.

Not only did the mentally retarded children have just half as many contacts in the total number of contacts made, but the mean child-child associations showed an even wider disparity. The retarded group made only 1/3 as many child-child contacts as did the Agnes Russell children, while, in contrast, they showed about twice as many adult contacts as the Agnes Russell students. This may have been suspected when it is realized that the retarded children need more adult supervision. In comparing the self-initiated contacts of the mentally retarded group to the teacher with the number of contacts made by the teacher with the number of contacts made by the teachers to the children, one sees the teachers made more contacts than the children. This also would be expected because these children have a constant need for assitance. The mean number of contacts for the retarded children is 19.1 for "SI" to teachers and 31.7 for "OI" from the teachers. The reverse is true in the Agnes Russell Center, with the mean "SI" to the teachers being 18.0 and the "OI" by the teacher being 9.2.

In comparing the self-initiated child contacts of the retarded group with the number of self-initiated contacts made with adults, the means are about the same, 21.9 and 19.0. However, there is a great difference in the amount of self-initiated contacts made by the children in the Agnes Russell Center where the mean for the child-child self-initiated contacts is 85.0 and the mean for the self-initiated towards the teachers is 18.0.

One of the most striking things noted in the consideration of these data for the two groups was a boy who obtained an extremely low number of contacts in the Agnes Russell Center. His total number of contacts was 79, although the mean for this group was 171.1 and the highest number of contacts was 285. In his child-child relationships it was about fifty-fifty, with an "SI" of 25 and an "OI" of 26. His child-adult contacts showed a different picture with 26 "SI" contacts, or the same number of "SI" as with children, but only 2 contacts were made toward him by the teachers. In this case the few contacts from the teachers did not appear to mean a lack of teacher interest in the student. This was a very capable child who could keep himself creatively active without the help of the teacher. In contrast, his 26 "Si" contacts to the teacher made him the third highest in his group in contacting the teacher. The inference from this child's picture may be that being one of the brightest, if not the brightest child in the class, probably cuts down on his ability to communicate favorably with others and for others to communicate with him. This appears to suggest that at the other extreme of intellectual giftedness there is importance in the part communication plays in social interaction.

Conclusion

This study has barely tapped the surface of the possibilities for determining the pattern of social behavior within a group of educable mentally retarded children. It has also depicted some of the main differences between the social interaction of a retarded group when compared with the interaction of a group of normal children. It is hoped that this information will be helpful in directing efforts to better assess the needs of these retarded children in order to assist them in developing their own capacity for social interaction as well as to provide information which can be used as a reference point for future study.

CHART I

SAMPLE DIAGRAM OF TALLY SHEET USED FOR OBSERVING 13 CHILDREN IN MENTAL RETARDATION PROJECT

Child's		TEACHERS		CHILDREN								
Name		T_1	T_2	C_1	C_2	C_3	C_{11}	C_{12}	C_{13}	Group	TIME	DATE
C_1	S	卌 //	//// ////		//// //	/	///		///		9^{10}	10/21/58
	I		/									
	O	卌 卌	///		//	////			///		9^{40}	
	I	////										
C_2	S	//// ////	/	卌 /		卌 //	/	/			8^{30}	10/22/58
	I											
	O	//	卌	//		/	//				9^{00}	
	I											
C_3	S	卌	//	卌 卌		卌	/					
	I			/								
	O			卌								
	T											
C_{11}		卌	卌 /									
	I								卌			10/24/58
	O	卌 //	//	卌 /	///			//// ///			10^{10}	
	I											
C_{12}	S	卌	//	///		卌 /	///		卌		10^{40}	11/3/58
	I											
	O	//		/			/				10^{30}	
	I											
C_{13}	S		卌	///		卌	卌 /	卌			8^{45}	11/4/58
	I											
	O	//	卌 //	///		//	/	///			9^{15}	
	I											

CHART II

SAMPLE CHART OF 4 x 6 CARDS USED TO TALLY THE SOCIAL CONTACTS OF CHILDREN IN THE AGNES RUSSELL CENTER

Child's Name		ADULTS	CHILDREN	Group	NOTES
	S	𝍸 ///	𝍸 𝍸 𝍸 𝍸 𝍸	////	During Juice time- Children passed out cups to other children- helped the boys, answered questions of teacher re: book T was reading.
G_1	I		𝍸 𝍸 ///		
11/12/58					
9^{25}	O	𝍸 /	𝍸 𝍸 𝍸 𝍸 /		
9^{55}	I				
B_5	S	𝍸 𝍸 /	𝍸 𝍸 𝍸 𝍸 𝍸	𝍸	On roof- boy quite active in play- seemed to observe others & direct the children in play.
11/12/58	I		𝍸 𝍸 𝍸 𝍸 𝍸	///	
10^{00}					
	O	//	𝍸 𝍸		
10^{30}					
	I				

TABLE I

TABULATION CHART SHOWING THE ACTUAL NUMBER OF CONTACTS MADE BETWEEN CHILDREN IN MENTAL RETARDATION PROJECT DURING ONE HOUR EACH FOR 13 CHILDREN

		T$_1$	T$_2$	Ti	Mi	Ar	Ju	Di	Je	Ra	To	Ir	Jf	Gr	Su	Ru	Ob	Date
Ti	si	3	11									1			1	2		10/28,31
	oi	11	12								6	3		1		3		
Mi	si	9	16			2	1		1		4	2				1	3	10/24,28
	oi	5	18								12	13			3			
Ar	si	3	13					1		3		4	1	29		7		10/14,10/16
	oi	39	15							1		1		10		4		
Ju	si	7	6	1		1				1	2	3	13			2		11/6
	oi	14	19	3		1		1				2	8			1		
Di	si	9	3								2				3	1		10/14,16
	oi	18	5		2						4							
Je	si	24	15		1					1			2	1	2	3		10/24,30
	oi	23	20			1				3	1	5	1	6	3	4		
Ra	si	2	2			1					1							10/27,11/3
	oi	24	7			3	1				5				1			
To	si	2	15		4	4		22		1		6			1	11		10/24,30
	oi	15	35		2	2		15		1			1		3	5		
Ir	si	10	1	1	1	9	12			2	1			3				10/27,11/3
	oi	13	4		1	5	7		2		1			8	2			
Jf	si	13	1		1		9	1	1			3		14	1			10/28,10/30
	oi	20	9		2	1	8				1	1		23				
Gr	si	7	6		5	12	3		32	1	1	9						10/27,11/3
	oi	12	6			8			7			1				1		
Su	si	39	6			1										1		10/27,11/3
	oi	13	3			1						1						
Ru	si	21	11		1				1	3	3				1			10/9, 16
	oi	34	8		1								1	2	1			
OI TOTAL				2	13	30	25	26	34	12	14	20	16	47	9	28		
SI TOTAL				3	8	22	16	17	13	5	30	26	11	50	13	18		
Child-Child Total				5	21	52	41	43	47	17	44	46	27	97	22	46		

OI TOTAL-Other Initiated — SI TOTAL-Self Initiated

TABLE II

CHILD-CHILD CONTACTS DURING ONE HOUR COMPARED WITH CHILD-CHILD CONTACTS OVER EXTENDED PERIOD OF OBSERVATION

NOTE: One hour contacts derived by reading Table I across; extended contacts derived by reading Table I down.

TOTAL			SI CONTACTS				OI CONTACTS			
Across		Down	Across		Down	Combined	Across		Down	Combined
Gr	80	97	Gr	63	50	113	Jf	36	16	52
To	78	44	To	49	30	79	To	29	14	43
Ar	66	52	Ar	46	22	68	Ir	26	20	46
Jf	66	27	Jf	30	11	41	Mi	26	13	39
Ir	55	46	Ir	29	26	55	Je	25	34	59
Ju	39	41	Ju	23	16	39	Ar	20	30	50
Mi	37	21	Je	11	13	24	Gr	17	47	64
Je	36	47	Mi	11	8	19	Ju	16	25	41
Ti	17	5	Ru	9	18	27	Ti	13	2	15
Ru	14	46	Di	6	17	23	Ru	10	12	22
Di	12	43	Ti	4	3	7	Di	6	26	32
Ra	12	17	Ra	2	5	7	Ru	5	28	33
Su	4	22	Su	2	13	15	Su	2	9	11

TABLE III A

SUMMATION OF CONTACTS OF 13 CHILDREN IN MENTAL RETARDATION PROJECT

(SI=Self-initiated, OI=Other-initiated)

	Child-Child			Child-Adult			TOTALS		FINAL
	SI	OI	TOTAL	SI	OI	TOTAL	SI	OI	TOTAL
Ti	4	13	17	14	23	37	18	36	54
Mi	11	26	37	28	23	51	39	49	88
Ar	46	20	66	6	54	60	52	74	126
JU	23	16	39	13	33	46	36	49	85
Di	6	6	12	12	23	35	18	29	47
Je	11	25	36	39	53	92	50	78	128
Ra	2	10	12	4	31	35	6	41	47
To	49	29	78	17	50	67	66	79	145
Ir	29	26	55	11	17	28	40	43	83
Jf	30	36	66	14	29	43	44	65	109
Gr	63	17	80	13	18	31	76	35	111
Su	2	2	4	45	16	61	47	18	65
Ru	9	5	14	32	42	74	41	47	88
TOTALS	285	231	516	248	412	660			1176

Mean of FINAL TOTAL 1176/13 is 90.5

Mean of Child-Child Total 516/13........... 39.7

Mean of SI, Child-Child 285/13 .... 21.9

Mean of OI, Child-Child 231/13 .... 17.8

Mean of Child-Adult Total 660/13........... 50.7

Mean of SI, Child-Adult 248/13 .... 19.1

Mean of OI, Child-Adult 412/13 .... 31.7

TABLE III B

COMPACT COMPARISON OF CHILD-CHILD SI & OI & CHILD-ADULT SI & OI

	Child-Child		Child-Adult	
	SI	OI	SI	OI
Tl	4	13	14	23
Mi	11	26	14	23
Ar	46	20	6	54
Ju	23	16	13	33
Di	6	6	12	23
Je	11	25	39	53
Ra	2	10	4	31
To	49	29	17	50
Ir	29	26	11	17
Jf	30	36	14	29
Gr	63	17	13	18
Su	2	2	45	16
Ru	9	5	32	42

TABLE IV

SUMMATION OF CONTACTS OF 13 CHILDREN IN AGNES RUSSELL CENTER

	Child-Child			Child-Adult			Totals		FINAL TOTAL
	SI	OI	TOTAL	SI	OI	TOTAL	SI	OI	
B_1	160	102	262	12	11	23	172	113	285
B_2	47	44	91	12	6	18	59	50	109
B_3	91	68	159	25	9	34	116	77	193
B_4	106	93	199	9	15	24	115	108	223
B_5	25	26	51	26	2	28	51	28	79
B_6	65	65	130	18	8	26	83	73	156
B_7	101	63	164	43	10	53	144	73	217
B_8	125	55	180	28	11	39	153	66	219
B_9	93	34	127	18	15	33	111	49	160
G_1	37	19	56	8	7	15	45	26	71
G_2	88	54	142	26	16	42	114	70	184
G_3	104	74	178	5	3	8	109	77	186
G_4	64	68	132	4	7	11	68	75	143
TOT*	1106	765	1871	234	120	354	340	885	2225

Mean of FINAL TOTAL 2225/13........... 171.1

Mean of Child-Child Total 1871/13......... 143.9

Mean of SI, Child-Child 1106/13........... 85.0

Mean of OI, Child-Child 765/13 .... 58.8

Mean of Child-Adult Total 354/13........... 27.3

Mean of SI, Child-Adult 234/13 .... 18.0

Mean of OI, Child-Adult 120/13 .... 9.2

TABLE V

13 CHILDREN IN MENTAL RETARDATION PROJECT RANKED IN ORDER OF VARIOUS CATEGORIES

Total Contacts		In Child-Child Contacts						In Child-Adult Contacts					
		Total		SI		OI		Total		SI		OI	
To	145	Gr	80	Gr	63	Jf	36	Je	92	Su	45	Ar	54
Je	128	To	78	To	49	To	29	Ru	74	Je	39	Je	53
Ar	126	Ar	66	Ar	46	Ir	26	To	67	Ru	32	To	50
Gr	111	Jf	66	Jf	30	Mi	26	Su	61	Mi	28	Ru	42
Jf	109	Ir	55	Ir	29	Je	25	Ar	60	To	17	Ju	33
Mi	88	Ju	39	Ju	23	Ar	20	Mi	51	Ti	14	Ra	31
Ru	88	Mi	37	Je	11	Gr	17	Ju	46	Jf	14	Jf	29
Ju	85	Je	37	Mi	11	Ju	16	Jf	43	Gr	13	Di	23
Ir	83	Ti	17	Ru	9	Ti	13	Ti	37	Ju	13	Mi	23
Su	65	Ru	14	Di	6	Ra	10	Di	35	Di	12	Ti	23
Ti	54	Di	12	Ti	4	Di	6	Ra	35	Ir	11	Gr	18
Ra	47	Ra	12	Ra	2	Ru	5	Gr	31	Ar	6	Ir	17
Di	47	Su	4	Su	2	Su	2	Ir	28	Ra	4	Su	16

TABLE VI

13 CHILDREN IN AGNES RUSSELL CENTER RANKED IN ORDER OF VARIOUS CATEGORIES

Total Contacts		In Child-Child Contacts						In Child-Adult Contacts					
		Total		SI		OI		Total		SI		OI	
B1	285	B1	262	B1	160	B1	102	B7	53	B7	43	G2	16
B4	223	B4	199	B8	125	B4	93	G2	42	B8	28	B4	15
B8	219	B8	180	B4	106	G3	74	B8	39	B5	26	B9	15
B7	217	G3	178	G3	104	B3	68	B3	34	G2	26	B8	11
B3	193	B7	164	B7	101	G4	68	B9	33	B3	25	B1	11
G3	186	B3	159	B9	93	B6	65	B5	28	B6	18	B7	10
G2	184	G2	142	B3	91	B7	63	B6	26	B9	18	B3	9
B9	160	G4	132	G2	88	B8	55	B4	24	B1	12	B6	8
B6	156	B6	130	B6	65	G2	54	B1	23	B2	12	G1	7
G4	143	B9	127	G4	64	B2	44	B2	18	B4	9	G4	7
B2	109	B2	91	B2	47	B9	34	G1	15	G1	8	B2	6
B5	79	G1	56	G1	37	B5	26	G4	11	G3	5	G3	3
G1	71	B5	51	B5	25	G1	19	G3	8	G4	4	B5	2